FINAL ENVIRONMENTAL ASSESSMENT - August 5, 2003

U.S. FISH AND WILDLIFE SERVICE, DEPARTMENT OF THE INTERIOR

FINAL ENVIRONMENTAL ASSESSMENT

PROPOSAL TO ESTABLISH OPERATIONAL GENERAL SWAN HUNTING SEASONS IN THE PACIFIC FLYWAY

I. PURPOSE AND NEED FOR ACTION

A. BACKGROUND

Flyway Management Approach

In developing management actions for migratory game birds, the U.S. Fish and Wildlife Service (Service) has publicly supported the goals, objectives, and management strategies identified in the various Flyway management plans for both Tundra (*C. columbianus*) and Trumpeter (*C. buccinator*) Swans (Hartwig 1989, Gritman 1991, Schmidt 2000). It has encouraged cooperative, multi-State-sponsored, Flyway Council-endorsed projects for restoring migratory flocks of Trumpeter Swans within their historic range and has supported Flyway Council-endorsed hunting seasons on Tundra Swans within prescribed guidelines that meet overall objectives for all swan populations.

In the 1995 Environmental Assessment (Bartonek et al. 1995), the Service acknowledged that there was some unauthorized kill of Trumpeter Swans outside of sanctioned hunting seasons. Such activities have always been considered illegal and are prosecuted when detected. In addition, some accidental and incidental killing of Trumpeter Swans has been known to occur in existing regulated hunting seasons. Such accidental hunting losses were believed rare, and most likely will continue to be proportional to size and distribution of Trumpeter Swan populations. When such taking has negligible impacts on achieving management objectives, the Service position has been and continues to be that ongoing or new hunting programs, whether for Tundra Swans or other waterfowl, should be neither curtailed nor prohibited because of the chance killing of a Trumpeter Swan. Conversely, Tundra Swan hunting should be restricted or not permitted at times of the season or in places where it would irreparably affect the status of a particular population of Trumpeter Swans.

As policy (Hartwig 1989, Schmidt 2000), the Service supports the concept of Flyway management of waterfowl and gives strong consideration for Flyway Council-endorsed programs and recommendations. Therefore, the Flyway Councils have been urged to carefully examine impacts of waterfowl hunting programs on Trumpeter Swan restoration efforts and vice versa and resolve conflicts prior to making recommendations to the Service. Also, the Service will and must give consideration to the broad interests of all of the public in management of its migratory bird resources. When there are irreconcilable differences among States, Flyway Councils, and the public regarding appropriate

management for Trumpeter and Tundra Swans, the Service policy will be to deal with such issues on a case-by-case basis, investigate the biological implications, document the results of those investigations and institute any necessary remedial actions.

B. NEED FOR THE PROPOSED ACTION

A Tundra Swan hunting season that also permitted the take of a limited number of Trumpeter Swans in the Pacific Flyway was instituted in 1995. From 1962 until 1995, a season allowing only the take of Tundra Swans had been in effect. During the Tundra Swan seasons, it was known that some small number of Trumpeter Swans were taken by swan hunters who mistook them for Tundra Swans. The limited take instituted in 1995 was authorized in order reconcile potentially conflicting strategies for managing two swan species in the Pacific Flyway. The potentially conflicting strategies are: (1) to enhance the winter range distribution of the less abundant Rocky Mountain Population (RMP) of Trumpeter Swans by severely restricting or eliminating swan hunting in portions of the Pacific Flyway open to swan hunting, and (2) to continue to provide harvest opportunities of the more numerous and widely distributed Western Population (WP) of Tundra Swans in the Pacific Flyway.

The Service has addressed this issue in a sequence of Environmental Assessments (Bartonek et al. 1995, Trost et al. 2000, Trost et al. 2001). The Service issued a finding of no significant impact with respect to these seasons based on the assessments in August of 1995, July 2000, and June 2001. The proposed actions in these Environmental Assessments represented a balance between the two competing management strategies by establishing a general swan season in portions of Montana, Utah, and Nevada that allowed the taking of any species of swan (*Cygnus* sp.), subject to stringent conditions:

(1) a limited quota on the take of Trumpeter Swans, which, upon being reached, would trigger the cessation of all swan hunting in the designated area;

(2) modification of the already limited take and restricted seasons on Tundra Swans to enhance the likelihood that Trumpeter Swans would be successful in expanding their winter range, and;

(3) the development and implementation of a program to monitor the effectiveness of this action.

The previous Environmental Assessments provide a review of the biological information through the winter of 2000. The temporal scope of the 2001 Environmental Assessment encompasses the 2002-2003 hunting season. Further, in the 2001 Environmental Assessment, the Service indicated that it would review the information gathered during the two hunting seasons covered by the 2001 Environmental Assessment with respect to the potential impacts of the experimental swan season implemented in Utah, and the operational seasons implemented in Montana and Nevada described in that document.

This Environmental Assessment addresses information obtained from the past two hunting seasons and includes discussion of public comments and concerns during the entire history of this process, new and supplemental information gathered by the Service and cooperators during Fall and Winter surveys, as well as updated harvest information from the past two hunting seasons.

C. PURPOSE OF THE PROPOSED ACTION

The purpose of this proposed action is to establish a framework for hunting regulations to govern the take of Trumpeter, Tundra, and, more recently, Mute Swans in the Pacific Flyway. This framework will be based on past experience, including new information gathered over the past two years, related to the authorization of a limited take of Trumpeter Swans in the Pacific Flyway seasons in Montana, Utah, and Nevada.

D. SCOPE OF THE ENVIRONMENTAL ASSESSMENT

The geographic scope of the swan resource affected by this proposed action includes RMP Trumpeter Swans, WP Tundra Swans, and potentially feral Mute Swans (*C. olor*) should they occur in a hunt area. The geographic scope is restricted to portions of the States of Montana (only the Pacific Flyway portion), Utah, and Nevada where swans would be hunted. All States of the Pacific Flyway within the potential range of RMP Trumpeter Swans (Fig. 1) would be included in potential management actions designed to enhance the status and distribution of this species.

The Service views the RMP of Trumpeter Swans as a single management entity. However, due to concerns raised by the public, potential impacts on smaller groups of Trumpeter Swans associated with specific areas, such as Yellowstone National Park and/or the Tristate Area (as defined below), will be discussed in this Environmental Assessment.

The temporal scope of this proposed action is operational. The Service will review results with respect to both Tundra Swan and Trumpeter Swan harvests annually and proposed changes would be considered as a normal part of the annual hunting regulations process. Adjustments to these seasons will be made, if needed, as part of the normal annual regulatory process for hunting migratory birds. Procedures for issuance of annual regulations are found in [SEIS 88, Final Supplemental Environmental Impact Statement: Issuance of annual regulations permitting the sport hunting of migratory birds] (USDI 1988).

E. ADMINISTRATIVE ACTIONS SINCE THE 2001 ENVIRONMENTAL ASSESSMENT

Several administrative and judicial actions have occurred since the 2001 Environmental Assessment was issued that relate to the current Environmental Assessment:

E1. On August 22, 2000, the Service was petitioned to list a portion of the RMP of Trumpeter Swans as either a threatened or endangered distinct population segment (DPS) under the provisions of the Endangered Species Act (1973, as amended). The petitioners also requested that the Service consider emergency listing of the Tristate flock at this time. The Service acknowledged receipt of the petition and informed the petitioners that listing funds were not then available for processing of administrative petition findings. Additionally, the Service stated that the population trend data for the RMP of Trumpeter Swans indicated that there was no compelling evidence to indicate that emergency listing was appropriate. Subsequently, the Service issued the 90-Day Finding on this petition on January 28, 2003 (Federal Register 68(18): 4221-4228). This finding concludes: "On the basis of the data in our files, we find that the Tri-State Area flock of Trumpeter Swans does not constitute a DPS in the meaning of the Act and, therefore, is not a listable entity." Additionally, the finding concludes: "Therefore, we conclude that the Trumpeter Swan is not in need of additional protection beyond the current provisions of the MBTA."

E2. On October 3, 2001, the Fund for Animals, the Biodiversity Legal Foundation, the Utah Environmental Congress, the Humane Society of the United States, and two wildlife enthusiasts (collectively, "the plaintiffs") filed a complaint against the U. S. Fish and Wildlife Service and the Department of the Interior (collectively, "the defendants") challenging the Service's actions under MBTA, the ESA, and NEPA. On February 25, 2003, The United States District Court for the District of Columbia issued its finding:

1. The defendants authorization of the Trumpeter Swan quota was consistent with the MBTA and was not arbitrary or capricious.

2. The defendants authorization of the Trumpeter Swan quota without an EIS did not violate NEPA and was not arbitrary or capricious.

3. The challenge to the defendant's failure to act on the petition to list the Trumpeter was moot.

4. The Service's response to the plaintiffs' request for an emergency listing was without adequate explanation and ordered the Service to provide such explanation within 60 days to the plaintiffs.

E3. In July, 2002, the Pacific Flyway Council completed the requested (Trost et al. 2000, Federal Register 65(188): 58517) Trumpeter Swan Implementation Plan, a companion document to the Flyway Council's 1998 management plan. Progress toward the tasks identified by the cooperators in this plan have been recently described by Hemker (in press).

E4. The U.S. Court of Appeals for the District of Columbia has recently determined that Mute Swans should be included on the list of species covered by the MBTA (*Hill v. Norton*, 275 F. 3d 98, D.C. Cir. 2001). Therefore, this action proposes the inclusion of Mute Swans in the general swan season being proposed for the Pacific Flyway.

E5. On July 30, 2003, the Service responded to an alleged violation of the Information Quality Act in the preparation of the 90-day finding referenced in **E1** above. The Service concluded: "The Service has conducted an analysis of issues raised in your IQA request. You propose that we withdraw our 90-day finding. However, your allegations do not provide any information that would cause us to revise our conclusion that the petition is not substantial. Based on the above analyses, we see no new information in your request that would lead us to conclude that the Tri-state Area Flocks of trumpeter swan are either discrete or significant to the rest of the taxon within the meaning of the ESA. As a result of our analysis, we find that no correction of information is warranted."

F. AUTHORITY AND RESPONSIBILITY

In the United States the preeminent authority and responsibility for migratory game birds reside with the Secretary of the Interior and are derived from international treaties to which the Constitution specifies that only the Federal Government can be signatory. The key instrument defining Federal authority is the Migratory Bird Treaty Act of 1918 (as amended). Among those species designated as "migratory game birds" for which there is Federal management authority is the taxonomic family *Anatidae*, which includes ducks, geese, brant, and swans. Authority for establishing hunting seasons for both Tundra and Trumpeter Swans is provided in the Migratory Bird Treaty Act and appropriate Federal regulations (50 CFR). Regulations governing the establishment of annual regulations for the hunting of migratory birds are specified in *Title 50 Code of Federal Regulations, Part 20, Subpart K*. Any authorization of hunting or taking of swans or other migratory birds will be done in compliance with the Migratory Bird Treaty Act and associated regulations.

II. PROPOSED ACTION AND ALTERNATIVES

Actions Common to All Alternatives

Although not directly related to the issue of hunting seasons, the Service will continue to provide a leadership role in attempting to enhance Trumpeter Swan status and breeding distribution within the Pacific Flyway through increased efforts directed at reestablishment of breeding Trumpeter Swans in suitable habitats throughout the Pacific Flyway. The Service is currently funding the propagation of Trumpeter Swans for future release into suitable habitat in the Tristate Area and conducting an investigation into the population genetics of Trumpeter Swans throughout North America.

The Service would also continue to support cooperative efforts to address the winter distribution issues by working with State, non-governmental organizations (NGO) and individual partners. The Service does not plan to employ winter translocations as the primary method to address the winter distribution problem of RMP Trumpeter Swans. Rather, translocation proposals will be reviewed on a case-by-case basis, and employed as a method to limit risk to swans from direct over-winter mortality on an as-needed basis.

The Service requested The Pacific Flyway Council to develop a more detailed implementation plan to achieve the goals and objectives of the Council's 1998 Trumpeter Swan Management Plan (Trost et al. 2000, FR Vol. 65, No. 188, pg 58517) and this implementation plan has been completed (Pacific Flyway Council 2002). Additionally, substantial progress has occurred on accomplishing the specific tasks identified in the plan (Hemker, in press). Evidence suggests current and past management activities have made progress toward improving the winter distribution situation (Bouffard 2000). Implementation efforts will be continued by the Service under each of the alternatives to the greatest extent possible.

A. ALTERNATIVE 1 (PREFERRED ALTERNATIVE) - ALLOW A LIMITED TAKE OF TRUMPETER SWANS DURING RESTRUCTURED SWAN HUNTING SEASONS:

The Service would continue to establish a hunting season for Tundra Swans with an authorization of a small take of Trumpeter Swans in designated portions of Montana, Utah and Nevada, within the Pacific Flyway. Constraints imposed upon swan hunting seasons described in the 2001 Environmental Assessment on this issue (Trost et al. 2001) would be continued to reduce the possibility of sport-hunting take of Trumpeter Swans. Although the Service considers the seasons in Montana and Nevada operational as described in the 2001 Environmental Assessment (Trost et al. 2001), it will review those seasons in this document as well for completeness. Specific areas open to swan hunting in Montana, Utah and Nevada would remain as defined under the preferred alternative in the 2001 Environmental Assessment on this issue (Trost et al. 2001). In general, the proposed action continues the reduction and alteration of areas open to swan hunting from the area that existed prior to the 1995 Environmental Assessment in Montana, Utah and Nevada as follows:

Montana: Beginning in 1995, those portions of Teton and Pondera Counties lying west of US Highway 287 from Augusta to Chouteau and west of US Highway 89 to the Blackfoot Indian Reservation were closed to all swan hunting. Chouteau County was added to the swan hunt area of the Pacific Flyway portion of Montana at this time. This area is proposed for continuation as the area open to swan hunting in Montana under this alternative.

Utah: Beginning in 1995, the swan hunt area in Utah was reduced from Statewide to a portion of the Great Salt Lake Basin and further reduced for the 2000-2001 hunting season. The area proposed for swan hunting is as follows, and is the same as in recent years: those portions of Box Elder, Weber, Davis, Salt Lake, and Toole Counties lying west of I-15, north of I-80, and south of a line beginning from the Forest Street exit to the Bear River Migratory Bird Refuge (BRMBR) boundary, then north and west along the BRMBR boundary to the farthest west boundary of the Refuge, then west along a line to Promontory Road, then north on Promontory Road to the intersection of SR-83, then north on SR-83 to I-84, then north and west on I-84 to State Hwy 30, then west on State Hwy 30 to the Nevada-Utah state line, then south on the Nevada-Utah state line to I-80.

Nevada: The area open to swan hunting in Nevada is Churchill, Pershing and Lyon Counties. This area was not altered in the preceding Environmental Assessments and is the area proposed for continuation of swan hunting under this alternative.

In addition to alterations in the areas open to swan hunting, changes in the number of Tundra Swan permits and season closing dates were described in the previous Environmental Assessments (Bartonek et al.1995, Trost et al. 2000, Trost et al. 2001) and the Service proposes their continuation under this alternative as follows:

Montana: Season dates adjusted from the first Saturday in October to the Sunday closest to January 20, to the first Saturday in October to December 1. Total swan permits to be issued remain unchanged at 500.

Utah: Season dates were adjusted from the first Saturday in October to the Sunday closest to January 20, to the first Saturday in October to the second Sunday in December. Permits were reduced from 2,500 to 2,000. [Note: the 1995 Environmental Assessment actually increased the permit number to 2,750, but mandated the season closure as the first Sunday in December; these provisions were modified in the 2000 Supplemental Environmental Assessment along with the additional area restrictions and the reduction in quota].

Nevada: Season dates were adjusted from the first Saturday in October to the Sunday closest to January 20, to the first Saturday in October to the Sunday following January 1. Permit numbers remained at 650. This alternative proposes to maintain these regulations.

Additionally, the Service would continue to require the monitoring of swan harvests, by mail in Montana, and by examination in Nevada and Utah, with appropriate provisions for season closure to be implemented by States should take of Trumpeters reach the assigned quotas. Quotas would be 10 in Utah and 5 in Nevada. The quota in Utah was reduced in the 2000 EA (from 15 to 10) in recognition of the fact that a total accounting of all dead Trumpeter Swans could not be achieved. Based on reasonable estimates of reporting rates and losses to wounding, this reduction insured that these factors were taken into account in determining at what point to close the season to ensure protection of RMP Trumpeter Swans. The number of swan hunting permits would not be altered from numbers issued in the 2000-2001 hunting season. Swan hunters will be required to have all harvested swans physically examined in Utah and Nevada within 72 hours of harvest. In Montana, hunters must submit required harvest information within seventy-two hours of harvesting a swan. The seventy-two hour time period is to allow for a reasonable time period for hunters to contact the necessary State or Federal staff to have a harvested swan examined. The Service will require Utah to update the existing Memorandum of Understanding (MOU) with the Service that agrees to the following additional stipulations with regard to swan harvest monitoring in Utah: (1) swans must be physically checked within seventy-two hours of harvest; (2) a commitment to enforce this regulation must be made by the State of Utah; (3) Utah hunters must hunt with their permit in their possession, and said permit must be validated with date a swan is killed prior to removing the swan from the field; (4) adequate State provisions must be in place to effect a prompt season closure should the quota be reached; and (5) at a minimum, a weekly summary of swan harvests will be made to the Service and the Service will be immediately notified should the harvest quota be reached. The Service will not authorize a swan hunting season in Utah without such an MOU.

In addition, regulations for the general swan hunt will be no less restrictive than those described in the 2001 Environmental Assessment until the three-year average number of Trumpeter Swans inventoried in the annual fall survey of the RMP/U.S. breeding segment is $\geq$90% of the of the goal (614 adults) specified in the Trumpeter Swan Implementation Plan. However, regulations may become more restrictive if evidence clearly suggests that the limits currently in place are negatively impacting the RMP or segments thereof. Status of the RMP and its segments will be reviewed annually and considered during the regulations-setting process.

B. ALTERNATIVE 2 - NO ACTION:

Under the No Action Alternative, the management scenario used prior to 1994 would be re-instituted. The Service would continue to establish open seasons on Tundra Swans in all of Utah and parts of Montana and Nevada, while not allowing take of Trumpeter Swans. There would be no closure of areas where Tundra and Trumpeter Swans overlap in their fall/winter distribution.

Permits issued for take of Tundra Swans would be set at 2,500 for Utah, 500 for Nevada and 650 for Montana. Season open and close dates would revert to those in place prior to the 1995 Environmental Assessment (Bartonek et al. 1995). These would be an opening framework date of the Saturday nearest October 1 and a closing date of the Sunday nearest January 20.

Quotas and monitoring efforts described in Alternative 1 would not be in place since only Tundra Swans would be authorized to be taken. Some general monitoring of the hunt would be conducted but not for purposes of quota management. Law enforcement efforts would continue as part of the Tundra Swan season, with protection for Trumpeters accomplished through education, deterrence and, if necessary, apprehension of individuals who illegally harvest a Trumpeter or Mute Swan.

B. ALTERNATIVE 3 - CLOSE TUNDRA SWAN HUNTING IN TRUMPETER HABITAT:

Under Alternative 3, the Service would close areas to Tundra Swan hunting in those parts of Montana, Utah, and/or Nevada that are likely to be used by Trumpeter Swans.

If any Tundra Swan hunting was permitted, permits issued would depend on areas that remained open and would likely be further reduced. Under this alternative, based on existing information, the Service would close both Montana and Utah to all swan hunting, and also consider further restrictions in Nevada. However, the Service would consider proposals from the affected States for times and places where the States could document that they could still conduct Tundra Swan hunts with a negligible risk of harvesting Trumpeter Swans. Season framework dates, if offered, would be timed to avoid any take of Trumpeter Swans.

Quotas and monitoring efforts described in Alternative 1 would not be in place since only Tundra Swans would be authorized to be taken. Some general monitoring of the hunt would be conducted but not for purposes of quota management. Law enforcement efforts would continue as part of the Tundra Swan season, with protection for Trumpeters accomplished through education, deterrence and, if necessary, apprehension of individuals who illegally harvest a Trumpeter or Mute Swan.

SUMMARY OF DIFFERENCES AMONG ALTERNATIVES

EFFECTS	Alt. 1. Maintain Restructured Swan Hunting Season	Alt. 2. No Action (i.e., revert to regulations same as prior to 1995)	Alt. 3. Close Swan Hunting in Trumpeter Habitat
Swan Species Allowed in Harvest	All swan species, Trumpeter Swan take strictly limited by quota as described below.	Tundra Swans.	If season is allowed, only Tundra Swans.
Hunter Liability for Shooting a Trumpeter Swan	None.	Would be subject to prosecution for illegal take of a species for which there is no open season.	Would be subject to prosecution for illegal take of a species for which there is no open season.
Earliest Season Opening Date	Saturday closest to October 1, which ranges between September 27 and October 3.	Saturday closest to October 1, which ranges between September 27 and October 3.	If season is allowed, date would be modified to prevent potential take of Trumpeter Swans.
Latest Season Closing Date	MT -December 1. UT -2nd Sunday in December, which ranges between December 8-14. NV -1st Sunday following January 1(January 2-8).	Sunday closest to January 20, which ranges between January 17-23.	If season is allowed, date would be modified to prevent potential take of Trumpeter Swans.
Season Length in Days	Maximum allowed within outside framework dates but less than 100 days.	100 days.	If season is allowed, length would be determined by outside dates but would be less than 100 days.
Trumpeter Swan Quota and Season Closure	Quota not required in Montana. 15 Trumpeters to be allocated between Utah (10) and Nevada (5), with season closure should quota be attained.	No quota. No authorized season on Trumpeter Swans.	No quota. No authorized season on Trumpeter Swans.
Winter Range Distribution	Active participation by the Service. Participation by Pacific Flyway States dependent on interest, status of swan populations, and whether conflicts with hunt programs would be minimal or mitigated.	Active participation by the Service. Participation by States without swan hunts dependent on interest and status of swan populations. Other States may be reluctant to participate because of potential conflicts with hunt programs.	Active participation by the Service. Participation by States without swan hunts dependent on interest and status of swan populations. Support in other States may vary depending on perception of long-term impacts on harvest opportunities and habitat constraints.

Harvest Information	All hunters are required to report harvest and effort information via mail survey. Species composition would be by post-card bill measurement reporting in Montana and examination of all or part of bird by biologists in Utah and Nevada.	All hunters are required to report harvest and effort information via mail survey. Law enforcement efforts would continue as part of the Tundra Swan season with protection for Trumpeters accomplished through apprehension of individuals who illegally harvest a Trumpeter.	If season is allowed, all hunters are required to report harvest and effort information via mail survey. Law enforcement efforts would continue as part of the Tundra Swan season with protection for Trumpeters accomplished through apprehension of individuals who illegally harvest a Trumpeter.

III. DESCRIPTION OF THE AFFECTED ENVIRONMENT

A. THE SWAN BASE

Three swan species are native to North America: Tundra, Trumpeter, and Whooper Swans (*C. cygnus*). Except as vagrants, Whooper Swans occur only during winter and then mainly in the western Aleutian Islands; they would be unaffected by this action. Ranges of the Trumpeter (Fig. 1) and Tundra Swans (Fig. 2) include extensive areas throughout Canada and the United States. A fourth species, the Mute Swan, was introduced from Europe. Feral populations are present throughout parts of northern North America and would potentially be affected by this action.

1. Trumpeter Swans

Trumpeter Swans are segregated for management purposes, not biological differences, into three populations: (1) the RMP, focus of this proposal, consists of a migratory flock from interior Canada, a largely sedentary flock from the Tristate Area (portions of Montana, Idaho, and Wyoming), both of which winter primarily in the Tristate Area, and restoration flocks elsewhere in the Tristate Region, Oregon and Nevada (Fig. 1); (2) the Pacific Coast Population, which breeds mainly in Alaska and winters along the northern Pacific Coast (Fig. 1); and (3) the Interior Population, which is an amalgamation of independent restoration efforts in South Dakota, Nebraska, Minnesota, Michigan, Wisconsin, Iowa, Ontario, Ohio, and New York (Fig. 1).

Terminology related to various geographic components of the RMP of Trumpeter Swans has been a source of confusion to many agencies and individuals who have expressed an interest in the stewardship of this population. Over the years, the geographic components of the RMP have been called segments, subpopulations, populations, and flocks. There is little biological information upon which to decide if one term is more appropriate than the other. For clarity and consistency, the Service has adopted the terminology from the 1998 Pacific Flyway Management Plan (Pacific Flyway Council 1998) and this terminology is used throughout this Environmental Assessment. However, the Service notes that minor differences in terminology persist in various documents. For example, the recently completed Trumpeter Swan Implementation Plan (Pacific Flyway Council 2002) uses the

terms "RMP/U.S. Breeding Segment" for U.S.-nesting trumpeters, and "Tri-state Area flocks" in place of Tristate flocks." We acknowledge that individual authors have in the past, and, will undoubtedly in the future, take some liberties with this terminology and trust that readers will be able to accurately determine the author's intent from the context of the various texts referenced in this assessment.

> The "Tristate Area" refers to southeast Idaho, southwest Montana, and northwest Wyoming. The "Core Tristate Area" refers to Harriman State Park (HSP), Island Park Reservoir, Teton Basin, Henry's and South Forks of the Snake River and Camas NWR of Idaho; Red Rocks Lakes National Wildlife Refuge (RRLNWR), Centennial Valley, Hebgen Lake and Madison River and tributaries of Montana, and Yellowstone National Park and Jackson Hole of Wyoming (Fig. 3). The "Tristate Region" refers to the entire States of Idaho, Montana, and Wyoming. RMP Trumpeter Swans that summer in the U.S. are referred to as the "RMP/U.S. flocks." "Tristate flocks" refers specifically to swans that summer in the "Core Tristate Area." "RMP/Canadian flocks" refers to Trumpeters that summer in Canada and winter in the United States.

Trumpeter Swan numbers are estimated by a number of surveys throughout North America. The population index most relied upon by managers is the coordinated summer survey instituted in 1968 and conducted at 5-year intervals since 1975 (Caithamer 2001).

The most recent survey was conducted in 2000. Based upon seven continental surveys during 1968-2000, Trumpeter Swans have increased at about 6 percent per year over the survey period and now total more than 23,000 birds as of the late summer of 2000. This total represents an increase of about 535% between the 1968 survey and the most recent survey in 2000. More than 1,000 additional Trumpeters are now in captivity and being held by aviculturists and zoos. All three management populations have been growing at approximately the same rate since these surveys were instituted. The RMP, as a whole, is exhibiting exponential growth over the time span covered by these surveys and totaled more than 3,600 in 2000 (Caithamer 2001, Fig. 4). This number represents an increase of more than 350% since 1968 and 45% since the 1995 survey. It should be noted that the 1995 survey was conducted prior to the implementation of the experimental swan regulations allowing the limited take of Trumpeter Swans in the Pacific Flyway. The 2000 survey represents the population status at the end of the first 5-year experimental hunt period.

RMP Trumpeter Swans are also surveyed annually during the winter (Dubovsky 2003b), and the U.S. portion of the RMP is also inventoried annually in the fall, prior to the arrival of Canadian migrants (Dubovsky 2003a). Based upon winter counts during February, 2003, RMP Trumpeter Swans numbered 3,962 (Dubovsky 2003b), essentially unchanged from the number available when the 2001 Environmental Assessment was prepared (Olson 2001) (Fig. 4). This figure supports the conclusion of continued population growth and is in reasonably close agreement with the results of the 2000 range-wide survey (Caithamer 2001). Based on the midwinter survey for the period 1974-1975 through 2002-2003, the

RMP continues to increase at about 6 percent each year (Fig. 4) and averages about 20 percent young in the winter population.

As indicated above, managers recognize that the RMP of Trumpeter Swans originates from a variety of breeding areas, as is true of most migratory bird populations in North America. These areas are sometimes divided into the following 3 groups: (1) those that nest in Canada; (2) those that nest in the Tristate Region of Montana, Wyoming, and Idaho; and (3) those that have been established through expansion efforts in Montana , Nevada, and Oregon (see previous section on terminology). Trends in winter counts vary among the 3 groups of birds but have not been consistent, although the surveys poorly apportion birds to these groups. Similarly, management activities undertaken in recent years apparently have not had the same impact on all components of this population. Numbers of RMP Trumpeter Swans breeding in Canada have continued to increase, while numbers of Trumpeter Swans breeding in the United States declined substantially following the cessation of the winter feeding program at RRLNWR and associated management actions in the winter of 1992/93. These actions predated the time when harvest of both swan species was permitted in the Pacific Flyway. Trumpeter Swan numbers increased both in Canada and in the United States during the first 7 years of the experimental hunt program. Trumpeter Swan numbers in the conterminous United States have generally been increasing, although they have not reached levels present during the active winter feeding program (Fig. 4).

Numbers in the fall 2002 survey (Dubovsky 2003a) and in the 2003 midwinter inventory (or the Tristate flocks declined 23% and 10%, respectively, when compared to the previous year's counts (Dubowsky 2003b, Fig. 4). The declines in the most recent year can not be accounted for by losses associated with hunting (i.e., no known harvest occurred during the preceding winter, Table 2) Further, there was no evidence to suggest that a large amount of mortality occurred during this interval. Weather in the Tristate Area during the winter of 2001-2002 was relatively mild. If swan mortality during the winter occurs in this region, it usually is associated with severe winter weather. Observers documented the mortality of only 34 birds (Whitman 2002) out of the total number of RMP Trumpeter Swans wintering in the Tristate Area in 2002 (4,415 birds: Dubovsky 2003b). The number of mortalities was similar to that observed in the previous winter. We do not know what portion of these dead birds was associated with nesting areas in Canada in relation to those nesting in the U.S., so we cannot attribute even this level of winter mortality solely to numerical changes in the Tristate flock. Observations through April also did not document significant incidences of mortality in late Spring (D. Munoz, Southeast Idaho Refuge Complex, pers. comm.).

The Service notes that short-term changes in population indices can be misleading and should not be interpreted as conclusive proof of population change. For example:

> Numbers of Trumpeter Swans in the 1988 midwinter survey declined substantially, but then recovered in the following year (Fig. 4). In addition, changes of the magnitude that were observed in the fall survey between 2001 and 2002 (Fig. 4)

have occurred previously. In 1986, the fall count for the Tristate flock also declined about 23% from the previous years index. However, in 1987, the index rebounded, increasing 38% above the 1986 fall count.

The Service also notes that the Fall survey (and all surveys, for that matter) is not a census of all birds, and that many factors can influence the count in a given year. The Service believes it is more meaningful to look at longer term trends in numbers versus information from any individual year. Based on the period 1993 through 2003, the fall survey of the Tristate flock shows an average rate of increase of approximately 2% ($0.10 > P > 0.05$). Although the evidence to suggest an increase in Trumpeter Swan abundance is weak statistically, the data indicate no evidence of a decline in Tristate Trumpeter Swans associated with the period 1993-2003. Further, considering only the period since take of a limited number of Trumpeter Swans was authorized, there is no evidence of any change in the number of Tristate Trumpeter Swans inventoried in the fall survey.

In summary, since 1995, numbers of RMP Trumpeter Swans appear to have increased despite the authorization of a limited take associated with the implementation of general swan seasons beginning in that year. Numbers of RMP Trumpeter Swans breeding within the United States have not increased to former levels from the low number estimated in 1993, and continue to remain below objective levels specified in the Management Plan. Numbers increased relatively steadily in the fall survey through 2001, but experienced a decline in 2002 (Fig. 4). At present, this decline is unexplained, although a more modest decline was also observed in the winter 2003 survey when compared to the count in the previous year (Fig. 4). Trumpeter Swans have not reached levels that were present in the United States before the cessation of feeding programs at RRLNWR and the institution of other intensive management activities that were undertaken to address the winter distribution concerns of this population. However, the Service notes that the winter feeding program that was in place until 1992 arguably increased the carrying capacity of the region above that which is inherent in the natural environment; thus, numbers prior to that time probably can not be sustained by the habitat in its natural state.

Trumpeters are classified as a migratory game bird. Prior to 1995, Trumpeter Swans had not been hunted, since Federal protection was authorized first in 1913 and then successfully in 1918. They are not classified as being either "threatened" or "endangered" under the Endangered Species Act. However, in the 1960s, the species was listed under the Service's "Red Book" based on the limited understanding of it's status at that time. The Red Book is an international compilation of globally threatened or endangered species prepared under the auspices of the International Union for the Conservation of Nature. In 1989, the Service was petitioned to list the RMP as threatened, but the petition presented information insufficient to conclude that such listing was warranted (55(81): Federal Register: 17646-17648, April 16, 1990). In 2000, the Service was petitioned again to list the Tristate flock under the provisions of the Endangered Species Act as either a threatened or endangered DPS. As stated previously, the Service issued a 90-day finding on this petition on January 28, 2003. This finding concluded that this group was not a

listable entity, nor was the RMP in need of protection under the provisions of the Act (Federal Register 68(18): 4221-4228).

The winter distribution of Trumpeter Swans in the Pacific Flyway remains concentrated primarily in southeastern Idaho and some potential for winter losses continues. Heavy wintering use is made of the Henry's Fork of the Snake River by RMP Trumpeter Swans. Perhaps, more than a hundred swans died from starvation on the Henry's Fork in the winter of 1988-89, although exact numbers are not known. The die-off drew considerable media attention and prompted the 1989-petitioning for Endangered Species Act listing. However, since 1989, there have been few winter losses recorded and the hazing program has helped limit further growth of this wintering concentration in this specific area. During the winter of 2002-2003, numbers of Trumpeter Swans associated with HSP totaled only about 10 percent of the total midwinter population, representing a decline from about 20 percent at the time the 2001 Environmental Assessment was prepared, even though the total number of Trumpeter Swans estimated was essentially the same in these years. The Service notes that waterfowl distributions and migratory behavior are often impacted by weather events. Migratory birds are among the most resilient groups of animals in their ability to react to such changing conditions. The Service fully expects that variable weather conditions (such as freezing conditions or drought) will be encountered in the future and believes such natural occurrences should be considered as part of the birds natural environment and, as such, weather events should not precipitate management actions unless or until evidence of significant direct mortality can be demonstrated. Should weather events lead to an appreciable movement of Trumpeter Swans into existing hunt zones, the Service believes that the quota system in place will preclude any population-level effects. Interesting observations were recorded during the winter of 2002-2003 that documented Trumpeter Swans field feeding at various locations in southeastern Idaho. This was encouraging evidence that, at least under the conditions present at the time, Trumpeter Swans were able to exploit different food resources than the aquatic vegetation upon which they have historically relied.

The Pacific Flyway Management Plan for RMP Trumpeter Swans (Subcommittee on RMP Trumpeter Swans 1998), endorsed by the Pacific Flyway Council and supported by the Service, calls for aggressive action to broaden the breeding and winter distribution of swans and restore a tradition for migration, in part, to alleviate chronic wintering problems. Since 1990, the Service, States, Bureau of Reclamation, and others have spent more than $1 million in trapping, translocating, hazing, and monitoring activities. Efforts to re-establish migratory behavior have shown limited success to date.

2. Tundra Swans:

Tundra Swans are segregated for management purposes into two populations: (1) the WP, object of this proposal, which breeds in western Alaska, migrates mainly through the Tristate Area, Utah, and Nevada, as well as along the west coast, to winter mainly in California (Fig. 2); and (2) the Eastern Population (EP), which breeds mainly in Arctic Canada and winters mainly on the eastern U.S. coast.

Numbers of Tundra Swans are indexed annually by the midwinter survey conducted in major waterfowl concentration areas across North America. Indices for both Eastern and Western Populations display long-term upward trends. The WP has increased at an annual rate of about two-percent per year since 1955, and has averaged more than 90,000 birds during the most recent 5-year period. This average is 150% of the population objective in the Pacific Flyway Council Management Plan for this population. The most recent midwinter index suggested about 100,000 Tundra Swans in the WP in January of 2003 (Fig. 5).

The Pacific Flyway Council and the Service cooperatively developed management plans for WP Tundra Swans (Subcommittee on Whistling (Tundra) Swans 1983, 2001). Objectives include:

- Maintain a 3-year average population index of at least 60,000 swans as estimated by the midwinter waterfowl survey;
- Maintain current patterns of distribution throughout the swan's range;
- Provide breeding, migration, and wintering habitats of sufficient quantity and quality to maintain the desired numbers and distribution of swans;
- Provide for aesthetic, educational, scientific, and hunting uses of these swans; and
- Provide for sustainable sport and subsistence harvests of WP Tundra Swans.

Federally authorized hunting seasons on Tundra Swans were first allowed in Utah in 1962. WP Tundra Swan seasons are now allowed in portions of Alaska, Montana, Utah, and Nevada. Seasons on EP Tundra Swans are authorized for Montana (Central Flyway portion), North Dakota, South Dakota, Virginia, North Carolina, and New Jersey. Sport hunting programs are endorsed by all Flyway Councils with a harvest objective of generally less than 10 percent of the winter population. Harvest is allocated among States by permits. State-administered permit systems provide good estimates of harvest. Sport harvest of the WP and EP is less than 2 and 4 percent of their respective midwinter swan population indices; but the combined subsistence harvest (8 percent) and sport harvest (2 percent) of the WP total about 10 percent. Permit allocation, hunter participation, harvest, and age-composition of the harvest, by State, as related to WP Tundra Swans are presented in Tables 1a-1d**.**

3. Mute Swans:

Mute Swans became established in North America through escapes and intentional releases from captivity. In the Atlantic and Mississippi Flyways where they breed in the wild, more than 7,000 birds on average were counted during winter surveys in 1985-94. In the Pacific Flyway, Feral Mute Swans were first recorded in the midwinter inventory in 1975, and averaged 5 swans per year during 1993-2002. The Pacific Flyway distribution

of Mute Swans in the wild is largely dependent upon where they escaped or were released from captivity, with most being reported in Washington and Oregon; however, they were reported in Nevada and California during 2 winters. Mute Swans have recently been added to the species covered by the MBTA by the U.S. Court of Appeals for the District of Columbia (*Hill v. Norton*, 275 F3d98, D.C. Cir. 2001). Therefore, this action proposes the inclusion of Mute Swans in the general swan season being proposed for the Pacific Flyway.

B. THE SWAN HABITATS

1. Trumpeter Swans:

Trumpeter Swans historically occurred over much of northern North America, excluding arctic areas, with populations wintering along the Atlantic, Pacific, and Gulf of Mexico coasts. Trumpeters nested in the prairies and bottomlands of the mid-continent where they were among the first waterfowl to be negatively impacted by settlement. Today, RMP Trumpeters nest in small wetlands and lakes in subarctic taiga, boreal forest, and aspen parklands in southern Yukon, northeastern British Columbia, southern Mackenzie District, Alberta, and southeastern Saskatchewan. In addition to the Canadian nesting areas, RMP Trumpeter Swans nest in lakes and other wetlands in the mountainous portions of the Tristate Area of Montana, Idaho, and Wyoming, and in some of the Great Basin marshes found in Nevada and Oregon, generally seeking undisturbed habitats with aquatic foods. The Centennial Valley, Teton Basin, Yellowstone Park, Harney Basin, Summer Lake, and Ruby Lake are some of the more important Trumpeter nesting areas in the western United States for the RMP of Trumpeter Swans.

Aside from restoration flocks in Oregon and Nevada, which are largely non-migratory and primarily of Tristate origin, a majority of RMP Trumpeter Swans stage in fall or winter in the Tristate Area. This large concentration of migrating and wintering RMP Trumpeter Swans in and near HSP on the Henry's Fork of the Snake River in southeastern Idaho and at RRLNWR in southwestern Montana is the chief management concern for this population. Swans and other waterfowl using the HSP sanctuary have, in some winters, so depleted the submerged aquatic vegetation that they are at risk of starvation. Starvation losses and poor nutrition prior to onset of nesting may limit prospects for Trumpeter Swan population growth and range expansion; however, this does not appear to have occurred as yet.

Translocated swans use sites in the American Falls Reservoir in southeastern Idaho. Migrant swans have been observed as far south as the Central Valley of California and in Arizona. In general, wintering swans are dependent on naturally-occurring aquatic plants in sufficient abundance and nutritional quality. Within the RMP, Trumpeter Swans have not generally adapted to feeding in agricultural fields as have many other species of waterfowl. However, in the winter of 2002-2003, substantial numbers of Trumpeter Swans were observed feeding in potato fields in southeastern Idaho during the winter survey.

2. Tundra Swans:

WP Tundra Swans breed in western Alaska and, as their name implies, in tundra habitat. They are found during summer from the Koyukuk River south to the Alaska Peninsula. Some birds nest on Kodiak Island, but the vast majority occur on the Yukon-Kuskokwim Delta (Fig. 2). In migration, WP swans follow both coastal (minor) and interior (major) routes and use a diversity of habitat types ranging from estuarine, fresh-water, alkaline, natural, agricultural and wildlife-managed sites. Tundra Swans rely extensively upon aquatic vegetation throughout the year. In migration and wintering areas, sago pondweed is a favored food plant, but they will frequent upland areas to graze on grasses, sedges, and berries. They have learned to glean grain from both dry and flooded agricultural fields and forage on pasture to supplement their natural aquatic diet.

3. Mute Swans:

Mute Swans occupy the same habitats used by other swans and waterfowl and potentially compete with them for food and space.

C. AFFECTED AND INTERESTED PARTIES

The proposed action predominately and directly affects residents of Montana, Utah, and Nevada. People living elsewhere, but having an active interest and/or direct involvement in management of swans, may also be affected.

1. RECREATIONAL HUNTERS

The proposed action would directly affect the approximately 5,400 hunters who applied for the 3,150 total permits available in Utah (2,000), Montana (500), and Nevada (650) for the 2001-2002 hunting season. This number is also approximately the long-term average number of hunters who have applied for swan hunting permits in these States.

2. NON-GOVERNMENTAL ORGANIZATIONS AND THE PUBLIC

The proposed action predominately and directly affects residents of Montana, Utah, and Nevada. People living elsewhere but having an active interest and/or direct involvement in management of swans may also be affected. The proposed action would directly affect NGOs actively involved with Trumpeter Swan restoration; specifically, The Trumpeter Swan Society (approaching 500 members in 1995) which promotes the well being and restoration of Trumpeter Swans, and the Henry's Fork Foundation (700 members) which promotes dispersal of Trumpeter Swans and other waterfowl on the Henry's Fork River in order to restore the damaged world-class trout fisheries. Additional NGOs that have expressed an interest in this issue include the Humane Society of the United States, The Fund for Animals, Inc., the Animal Protection Institute, and the Biodiversity Legal Foundation. Many members of the general public have also directly contacted Service representatives concerning this issue.

3. BUSINESS

The proposed action would affect businesses that are partially dependent upon meeting the needs of hunters and services associated with Trumpeter Swan restoration efforts.

IV. ENVIRONMENTAL CONSEQUENCES

This section is comprised of a summary of the environmental consequences of implementing each of the alternatives on swan populations, their habitat, recreational activities and other factors identified during preparation and review of previous Environmental Assessments on this issue. Comments received during the sequence of Environmental Assessments have generally been similar, and we incorporate discussion and analysis of these in the following section. A summary of impacts is also presented in Table form at the end of this section.

A. ALTERNATIVE 1 (PREFERRED ALTERNATIVE) - ALLOW A LIMITED TAKE OF TRUMPETER AND MUTE SWANS DURING GENERAL SWAN HUNTING SEASONS:

The proposed action would authorize a small take of Trumpeter and Mute Swans during general swan seasons in designated portions of Montana, Utah and Nevada, within the Pacific Flyway provided that quotas are not exceeded for Trumpeter Swans. Possession, transportation, and disposition of all swan species would be governed by regulations applicable to all other waterfowl species (see 50 CFR Part 20).

The Tundra Swan hunting season that existed prior to 1995 was significantly modified by the 1995, 2000, and 2001 Environmental Assessments and subsequent regulations on this issue. This proposal would maintain all of these alterations, specifically the area restrictions that were then imposed, the number of permits to be allocated in Montana, Utah and Nevada, and the harvest-monitoring requirements.

The area restrictions were imposed to afford greater protection to Trumpeter Swans and the earlier season closure dates were also implemented with the idea that if Trumpeter Swans were moving in the Pacific Flyway, they would be more likely be moving later in the season and an earlier closure would afford additional protection to any dispersing Trumpeter Swans.

In addition to season area, permit and time modifications, the Service will expand its role in cooperative efforts to enhance the breeding and wintering distribution of Trumpeter Swans throughout the Pacific Flyway under this alternative. The Service will continue attempts to achieve this action through introduction of additional Trumpeter Swans into suitable habitat throughout the Pacific Flyway, and by continuing management efforts to discourage use of the Tristate wintering concentration area. The more detailed implementation plan to achieve the goals and objectives of the Pacific Flyway's 1998 RMP Trumpeter Swan Management Plan requested by the Service has been completed (Pacific

Flyway Council 2002), and significant progress has been made toward the objectives presented in this plan (Hemker in press).

a. THE SWAN BASE

Trumpeter Swan: The Service would: (1) actively participate in efforts to enhance the breeding and winter distribution of Trumpeter Swans, and (2) maintain the biologically conservative harvest quota of 15 Trumpeter Swans in Utah and Nevada. The Service notes that for the first seven of the eight years that have passed since the experimental hunt was initiated, RMP Trumpeter Swans exhibited a substantial population increase as measured by both the 5-year periodic survey and the annual midwinter estimates (Caithamer 2001, Dubovsky 2003b, Fig. 4). This population increase occurred during the period when the legal take of Trumpeter Swans was permitted, and despite losses to the population caused by direct management activities (i.e., the winter-translocation program). Further, the increase was seen in both the U.S. and Canadian flocks through the 2000 inventory (Caithamer 2001, Fig. 4). The most recent survey results (fall 2002, winter 2003) were lower than during the previous year. However, as indicated above, these declines followed the lowest level of harvest recorded during the 8 years when Trumpeter Swan take during general swan seasons was legal, and we can find no reasonable association between the harvest and the drops in counts.

The Service recognizes that not all components of the population appear to be increasing at the same rate, however, as noted in the status review, increases in the Tristate Area are not expected to equal those in the more northern areas because of existing habitat limitations. The Service believes that the eight years of experience with the limited take of Trumpeter Swans during general swan seasons clearly demonstrates that neither the population nor any geographic component of the population is likely to be adversely impacted following implementation of this alternative. Anticipated take in future seasons is expected to remain very low.

Estimated Harvest Impacts: Numeric: The Service believes that the general continued increase in the RMP of Trumpeter Swans is clear evidence that the limited harvest currently occurring is not a threat to continued growth in this population. During the five-year period of the first experimental hunt (1995-1999), a total of 32 Trumpeter Swans were known to have been harvested by hunters in Montana, Utah, and Nevada (Table 2). Four additional Trumpeters are known to have been shot in the Pacific Flyway in the 2000-2001 season, none were harvested in any State in the Pacific Flyway during the 2001-2002 season, and five (3 in Montana and 2 in Utah) during the 2002-2003 season (Table 2). Additionally, one was known to have been harvested in Montana in the 1994-1995 season, prior to the implementation of the original experiment. Thus, a total of 42 Trumpeter Swans are known to have been harvested during the period, 1994-95 through 2002-2003 (9 years). Expanding this number for both noncompliance (non-reporting) and wounding loss, suggests that as many as 61 Trumpeter Swans may have been harvested in the Pacific

Flyway (less than 7 per year). Of these, 55.7% or 34 were estimated to have been taken in Montana, with the remaining 27 estimated taken in Utah (26) and Nevada (1).

The Service notes that the Tristate flocks increased relatively steadily through the 2001 fall survey, but as noted above the count declined in the Fall survey of 2002. The Service believes that this decline cannot be attributed to harvest, because this decline followed the only year with no harvest of Trumpeter Swans recorded in Montana, Nevada, or Utah. The Service also notes that in all other years when a limited Trumpeter Swan harvest has been legal, both RMP and the Tristate flocks have generally increased, suggesting no negative impacts of the harvest management regime that has been employed during the past 8 years.

The Service believes that the vast majority, if not all, of the Trumpeter Swan harvest in the Montana season is derived from the rapidly expanding northern (Canadian) breeding flocks of the RMP because the area open to hunting in Montana is generally north of the Core Tristate Area and few if any Trumpeter Swans are expected to migrate northward during the fall. Continued numeric and geographic growth of these flocks supports the Service position that such harvest levels pose no threat to this component of the population and that is why Montana is exempt from an actual assigned quota. The Service is aware that a few have suggested that hunting may be responsible for the extirpation of a few Trumpeter Swans along the East Front of the Rocky Mountains in Montana. However, the Service review of this contention has found it without merit. A review of the available data indicates that a few pairs (up to 3) of Trumpeter Swans did become established along the East Front, but were not known to exist prior to the mid-1980s. Thus, they became established during the period when Tundra Swan hunting was being conducted in Montana. Further, based on the assessment of biologists in Montana, it appears likely that drought conditions that have persisted in this area since the late 1980s are responsible for the disappearance of these birds, because all the ponds once used for breeding currently are dry. None of the above is intended to imply that, should harvest monitoring programs and population information suggest that adjustment to this season are needed to maintain the long-term trend, the Service would not consider alterations to these seasons. However, the overwhelming evidence at this time supports the Service conclusion that this is not the case.

~~F~~ew have suggested that harvest of Trumpeter Swans in Nevada negatively impacts Trumpeter Swan populations. Only a single Trumpeter Swan is known to have been harvested in the past 9 years and there is no evidence that the season as it exists places any number of Trumpeter Swans at risk. Therefore, the existing season in Nevada is not presently considered an issue that needs to be addressed. Nonetheless, should harvest monitoring programs and population information suggest that adjustments to this season are needed to attain objective levels, the Service would consider alterations to these seasons. However, the overwhelming evidence supports the conclusion that changes are not needed to address concerns regarding population status or distribution of Trumpeter Swans at this time.

Therefore, the Service believes the harvest in Utah is the main issue to those whose concerns are based on something other than a general objection to the hunting of swans (or specifically Trumpeter Swans). Harvest in Utah could include representatives from both Canadian and Tristate breeding flocks. The Service has considered both aspects of this situation as follows.

First, the Service remains confident that the numeric losses that can be reasonably expected from the current hunting regime will have no impact from an overall population perspective. Estimated total RMP Trumpeter Swan harvest has averaged less than 7 birds per year over the past 9 years in these three States and the total population has continued to grow relatively steadily, supporting this conclusion. Additionally, any harvest losses in Utah can most reasonably be expected to be equal to the relative proportion that each breeding flock contributes to the population as a whole. Therefore, losses in Utah are expected to be approximately 90% Canadian flocks and approximately 10% derived from the Tristate breeding flocks. This in turn equates to a maximum take from the Core Tristate Area of approximately 2 individuals per year under a worst-case scenario. This estimate is based on what the Service feels is the most reasonable projection and assumes that the quota is actually reached. The Service also believes this to be a conservative approach, because some have suggested that Tristate birds are less likely to migrate than Trumpeter Swans from northerly breeding areas. If this were true, the actual proportion of Tristate birds in the Utah and Nevada harvest would be even less. The Service notes that the quota has never been reached in either Utah or Nevada during the last 9 years. Based on estimated actual harvest (known harvest adjusted for both non-compliance and wounding loss), the estimated loss of Tristate Trumpeter Swans for the period, 1994-2001 (9 seasons), would be approximately 2.5 individuals (25 X 10% = 2.5) during this period. Based on this assessment, and as previously stated (FR Vol. 65, No. 188, Wednesday, September 27, 2000:58152-58175), the Service does not consider the expected level of harvest to be a significant threat to RMP Trumpeter Swans in general, or to any individual component of this population.

Estimated Harvest Impacts: Distribution: The restricted winter distribution of RMP Trumpeter Swans continues, despite more than a decade of management actions intended to alter this situation. The fact that this problem has existed for more than a decade, that the population has continued to grow, and that no additional losses specifically attributable to severe winter weather conditions, suggests to the Service that the threat to the population from the current winter distribution is perhaps overstated by some. This is not intended to suggest that the Service views the current winter distribution as desirable, nor that the Service is unaware that winter conditions have perhaps been more favorable than those historically experienced in this region. Regardless, the RMP has more than doubled in size since the 1989 winter die-off (Caithamer 2001) and should now be much better able to withstand winter losses without the threat of adverse impacts to the long-term welfare of the population as a whole. We assume such losses would be distributed proportionally between the various population components. Thus, winter losses of the magnitude that occurred in 1989 should be easily withstood by the population, and without jeopardy to the population as a whole or any identified component of the population.

At present, the Service is not aware of any effective methodology that will dramatically alter this winter distribution and notes that this problem is fairly common in waterfowl management. However, limited progress has been made toward improving the winter distribution (Bouffard 2000). The problem of wintering concentrations of both geese and swans either establishing or moving their wintering distribution further north is well documented. To date, it has proven beyond the capacity of managers to dramatically alter the winter distributions of waterfowl, despite several intensive and expensive efforts (Rusch et al. 1985; Shea and Drewien 1999). Therefore, the Service finds the limited changes in distribution that have been achieved to date encouraging, and suggests that perhaps such smaller, incremental improvements are really what is reasonable for management agencies to achieve.

The Service notes that exact knowledge of historical distributions and migration pathways is based on very limited evidence (AOU 1983, Banko 1960, Hayward et al. 1976). The existing evidence is insufficient to determine if migration through the Great Salt Lake Basin was the only, or even the major migration pathway for Trumpeter Swans associated with this area. There is little evidence that the Bear River area has ever been an important migration and/or wintering area for Trumpeter Swans, and despite contentions to the contrary, the Service is aware of only a few confirmed records that document Trumpeter Swans in this area throughout history. The Service notes that limited early banding of RMP Trumpeter Swans near Grand Prairie, Alberta, established the connection between that area and those Trumpeter Swans wintering in the Tristate Area, and also reported a limited number of recoveries from Nebraska, suggesting a more southeasterly from the Tristate Area (Mackay 1957). The Service also believes that migration southward through the Great Salt Lake Basin and perhaps westward following the Snake and then Columbia Rivers may well represent other historical migration routes. Further, the Service notes that the only current sustained southerly migration of RMP Trumpeter Swans follows the Green River drainage through Wyoming and eastern Utah and is the direct result of active management efforts by the State of Wyoming (Bill Long, WY Game and Fish, pers. comm.). Therefore, the Service's conclusion is that a variety of potential southerly migration strategies through various areas are possible, and that the best possibilities for improving the winter distribution of RMP Trumpeter Swans is further development and expansion of the approach used in Wyoming.

The issue that has been raised by some in discussions on the general impact of the Utah swan season is not the expected population effect of any harvest, but, rather the potential impact of that limited harvest on redistribution efforts. Some have suggested that because Tundra Swans stage at and migrate through Utah, this is the only reasonable avenue open to Trumpeter Swans currently concentrated north of this general area. However, as discussed above, the Service does not subscribe to this view. Additionally, some have suggested that because those Trumpeter Swans in Utah represent Trumpeter Swans with a more desirable migration pattern, they should be protected from harvest at all cost. The Service believes the latter part of this contention is unjustified by the available data and the status of RMP Trumpeter Swans (both in general and for all geographic components). There is no evidence, of which the Service is currently aware, to support the contention that

the harvest of a small number of Trumpeter Swans in the Great Salt Lake Basin is serving as an impediment to the establishment of new migration patterns of RMP Trumpeter Swans. The Service notes that RMP Trumpeter Swans migrate through and are known to be present at Freezeout Lake in Montana, and despite the occasional harvest of some individual Trumpeter Swans, there has been no discernable impact on either their migratory behavior or population status. The Service's opinion is that simply stopping the limited harvest in Utah will have little or no effect on the winter distribution of RMP Trumpeter Swans. If larger movements should happen, the Service is confident that the quota approach as implemented in recent years will provide sufficient protection for dispersing swans to avoid undue adverse impacts at either the general population or geographic-component level.

As stated above, The Service concludes that the loss of a few individual Trumpeter Swans in general swan seasons as currently structured in Utah does not pose any threat to redistribution efforts. Even so, in acknowledgment of those parties who believe differently, the Service imposed additional restrictions on the general swan season in Utah in 2000. These restrictions closed that portion of Utah to all swan hunting where 50% (7) of Trumpeter Swans had been killed in the 5-year experimental swan season. In contrast BRMBR accounted for 21% (3) of the reported harvest during this period (data supplied by the State of Utah). The additional restrictions also reduced the total number of swan hunting permits allocated to Utah from 2,750 to 2,000 and reduced the Trumpeter Swan quota from 15 to 10 for the State. This reduction in quota was in recognition of the known difficulty in adjusting the number of swans checked for those wounded and lost, and for non-reporting by hunters. The questionnaire survey conducted after the close of the hunting season is adjusted for these two factors. As stated previously, the Service feels that the information gained to date regarding the distribution of Trumpeter Swans harvested in Utah suggests that Trumpeter Swans were more likely to be encountered north of the BRMBR and associated with smaller wetlands, areas which are now closed by regulation. The Service will continue to monitor the distribution of the swan harvest, in addition to the actual number of swans harvested in Utah.

Harvest Monitoring: The Service has previously reviewed the adequacy of monitoring swan harvests (Trost et al. 2001). The Service manages all waterfowl cooperatively with States and other jurisdictions that share legislative mandates for the management of waterfowl. In establishing Federal frameworks, the Service does also occasionally establish guidelines for monitoring of such seasons as it has done in this case . These guidelines have been clearly stated in both previous Environmental Assessments of this issue and in Federal Regulations (FR Vol. 65, No. 188, Wednesday, September 27, 2000:58152-58157). Individual refuge operations and procedures are the purview of the refuge and are not addressed in Federal frameworks. All refuges develop and implement hunting regulations for their specific areas based on a separate Federal rule-making process, which is open to public comment and review. These regulations are consistent with or more restrictive than State regulations. The Service generally defers to States, but in some cases works closely with them, on implementation. This is done in recognition that States have the best local knowledge and logistical capability to accomplish these ends.

In this case, the Service has evaluated the harvest data provided by the States and its assessment is that reasonable diligence has been employed to this point, and that the data provided by the States is adequate to (a) monitor the take of Trumpeter Swans during the season, and (b) provide sufficient information to allow reasonable corrections for harvest losses that are not reported.

Some have suggested that substantial numbers of swans are not being examined as required. However, they include swans believed wounded and lost in their estimates of unreported swans. By definition, these swans are not retrieved and thus could not be checked by any known means. Wounding loss is an unfortunate reality of allowing hunting and the Service and State waterfowl managers have always taken this factor into account by expanding known losses by a factor for estimated wounding loss. Such expansions are estimates and the EA reports and uses this expansion in its assessment of harvest. Second, some have referred to the difference between known checked birds and estimated (via a questionnaire survey) harvested birds as additional unchecked swans. Again, the Service believes that this estimate is biased high due to well-documented deficiencies in questionnaire surveys used to estimate harvest (e.g., Rupp et al. 2000, Taylor et al. 2000, Cada 1983). In essence, unsuccessful hunters (i.e., those that fail to harvest a swan) are less likely to respond to a questionnaire survey, which leads to inflated estimates of actual harvest. The Service notes that the comment letters received in response to the previous Environmental Assessment on this issue (Trost et al. 2001) from the Pacific Flyway Council and the State of Utah provide actual data documenting this effect, and that both the Pacific and Central Flyways, as well as most individual States, recommended that further conditions on harvest monitoring not be imposed in those Pacific Flyway States because (then) current information was adequate for management purposes.

The Service carefully considered this issue and concluded that additional steps could improve the quality of the harvest information, and a more rapid response to close the swan season if a quota were reached. Because the concerns mentioned above were an issue primarily in Utah, for the 2001-02 season the Service required that the State of Utah sign a Memorandum of Agreement (MOA) designed to improve collection of information on harvested swans. Under this alternative, the Service would require that Utah renew the MOA with the Service, which included the following stipulations regarding swan harvest monitoring in Utah: (1) swans must be physically checked within seventy-two hours of harvest, (2) a commitment to enforce this regulation must be made by the State of Utah, (3) Utah hunters must hunt with their permit in their possession, and said permit must be validated with date and place the swan is killed prior to removing the swan from the field, (4) adequate State provisions must be in place to effect a prompt season closure should the quota be reached, and (5) at a minimum, a weekly summary of swan harvests will be made to the Service and the Service will be immediately notified should the harvest quota be reached. The Service will not authorize a swan hunting season in Utah without such an MOA.

The Service explicitly states that it does not intend to require same-day checks of swans in Utah in this MOA. The Service notes that no system can reasonably be considered

entirely without error and the expectation that we can account for every swan harvested every day is not reasonable. However, the Service does agree that a high level of real-time accountability is required of the harvest monitoring system in Utah. The Service assessment of compliance rates is in general concurrence with the comments submitted previously by the State of Utah, which stated that approximately 85-90% compliance with reporting requirements is currently being achieved. In addition, the Service uses reasonable assumptions for non-reported harvest and wounding losses, which result in conservative estimates of harvest. Mandating same-day check-stations can be expected to gain at best only 10-15% in additional accountability. Yet, this small gain in efficiency would come at considerable additional expense to the State of Utah and the Service. The Service believes the reduction in Utah's quota from 15- to-10 more than compensates for this small level of non-reporting. The Service also acknowledges and appreciates that the State of Utah has voluntarily instituted a required hunting training course for swan hunters in an effort to further reduce the take of Trumpeter Swans in the Utah season.

Comments specific to Yellowstone National Park and Red Rock Lakes National Wildlife Refuge:

The Service believes much of the concern expressed with regard to Trumpeter Swans stems from the trends in numbers of Trumpeter Swans associated with YNP and RRLNWR. These areas appear to harbor the last remaining, naturally occurring concentrations of Trumpeter Swans in the lower 48 States. The Service has stated previously that, although, it does not view these swans as a distinct entity, it does view them as an important component of the overall RMP, and strongly supports the stated objectives to maintain and enhance their numbers. Unfortunately, numbers of Trumpeter Swans associated with these two areas have not exhibited the same general trends as Trumpeter Swans elsewhere in North America (Figs. 4, 6). Causes for these different trajectories have not been identified, but the Service is cooperating with its partners in attempts to elucidate causative factors and improve management strategies.

Examination of survey data indicates that numbers at these two areas increased with the institution of winter feeding (1935) until the mid-1950s, and then began to gradually decline. The highest total number of Trumpeter Swans counted at RRLNWR was 380 in 1954, and the peak count of 75 was recorded at YNP in 1949. This general decline began prior to the onset of any swan hunting seasons in the Pacific Flyway (Fig. 6A). A pronounced reduction occurred with the cessation of winter feeding during the winter of 1992-93. Total (white birds + cygnets) numbers at RRLNWR declined from 128 in the fall count of 1992 to 40 in 1993 and have only modestly increased since then. Numbers at YNP have trended downward since a peak count of 75 was recorded in 1949, but did not decline markedly (only 4 birds) between the fall 1992 count of 30 birds and the fall 1993 count of 26 birds. Whereas historically the Tristate flocks were almost entirely comprised of swans associated with RRLNWR and to a lesser extent YNP, today it is primarily other areas within the Tristate that constitute the majority of the birds in the Tristate flocks.

The above trends are in contrast to the total RMP trends as indexed by the midwinter counts (Fig. 6B). It is clear that numbers have continued their upward trend for the total RMP, despite the cessation of winter feeding and the allowance of a limited take during the hunting season. The Service has concluded the following from this information: (1) that the allowance of a very limited take of Trumpeter Swans in previously existing Tundra Swan seasons has had no impact on the general population trend of the RMP, nor has it altered the trend that existed in any component; (2) since these birds all winter sympatrically and are exposed to the same winter weather conditions and limitations, these winter weather conditions are not currently limiting overall population growth; and (3) a likely cause for the different trend evidenced in these groups is associated with access to nutritional resources in early spring prior to nesting. Further, as previously stated by the Service, cessation of winter feeding has likely reduced the carrying capacity of Red Rock Lakes and perhaps adjacent areas in the Tristate Region to support Trumpeter Swans; moreover, this supplemental feeding likely promoted the increase observed during the 1930s and 1940s to levels that can not be sustained without these supplemental nutritional resources. The solution to the local trend would seem to focus on active land management in or near RRLNWR, and has very little if anything to do with swan hunting and winter distributions. These conclusions should not be interpreted to suggest that the Service is not supportive of the stated management goal of improving the winter distribution of the RMP of Trumpeter Swans. The Service continues to support this objective and believes strongly that movement of at least some of the RMP into more diverse wintering habitats will only serve to improve the long-term status of the RMP.

Tundra Swan: The number and distribution of Tundra Swans in Montana, Utah and Nevada has been largely unaffected by previous implementation of the actions contained in this alternative. The number of permits authorizing the take of swans would be maintained at the levels established in the 2000-2001 hunting season for Montana, Nevada and Utah. The anticipated harvest of Tundra Swans would remain within harvest-management guidelines for the population. Tundra Swan populations are currently above population objective levels.

Mute Swan: The number and distribution of Mute Swans would be largely unaffected by this action since very few birds occur in Utah, Montana or Nevada. Take of this species would be permitted. Little, if any harvest is expected.

b. THE SWAN HABITATS

Hazing, elimination of supplemental feeding, and other cooperative efforts to make current wintering habitats less hospitable (such as attempting to maintain very high or very low flow rates in the Henry's Fork) would continue. Due to concerns and doubts about the effectiveness of translocations, the Service will only support this activity on a limited, case-by-case basis and not as the preferred means of addressing the winter distribution problem. In summary, implementation of the portions of Alternative 2 dealing with swan harvest is not expected to significantly affect habitats used by Trumpeter, Tundra or Mute Swans.

c. RECREATIONAL HUNTING IMPACTS

In Montana, hunters will not be able to hunt swans in the western portions of Pondera & Teton Counties (areas open to Tundra Swan hunting prior to the original 1995 Environmental Assessment and subsequent regulations). However, the new opportunities afforded those hunting in the larger Chouteau County that were instituted in 1995 will be maintained.

Areas open to hunting in Nevada and season dates will remain unchanged from those established in the 1995 Environmental Assessment. The Nevada swan season will be closed if their assigned quota (established at 5 Trumpeter Swans) is attained.

In Utah, the additional constraints that have been in place, beginning with the 2000-2001 hunting season, would be continued. These constraints reduced the number of permits issued from 2,750 to 2,000; reduced the quota on Trumpeter Swan take from 15 to 10; and reduced the area open to swan hunting by closing all areas north of the northern boundary of the BRMBR.

a. AESTHETIC IMPACTS

Under this alternative, persons and NGOs interested in viewing swans will be impacted during the period of the swan season due to curtailed viewing opportunities. This will be for a relatively short period of time and opportunities for swan viewing will still be available in some locations. The additional restrictions on hunting opportunity implemented first in the 1999-2000 season would provide greater opportunity for viewing swans. In summary, impacts will be short-term and the number of Trumpeters harvested is expected to be low, causing minimal impact on viewing opportunity. The number of Tundra Swans authorized to be taken is also low and would probably not be noticeable in terms of viewing opportunity or other aesthetic concerns.

NGOs and persons either opposed to swan hunting or who believe expedited winter-range expansion of Trumpeter Swans is possible would continue to be dissatisfied with the swan seasons because of their belief that pioneering Trumpeter Swans would be killed.

b. LOCAL ECONOMIC IMPACTS

Business would continue to provide equipment and services to hunters and agencies involved in swan restoration efforts. Otherwise, impacts on the local economy are expected to be minimal.

2. ALTERNATIVE 2 - NO ACTION:

Under the "No Action" alternative, swan hunting regulations in effect prior to 1995 would be re-instituted. That is, only hunting of Tundra Swans would be legal. Areas, seasons, and numbers of permits for Tundra Swan hunting in Montana, Utah, and Idaho, would be

unmodified from those in place between 1983 and 1994. The entire State of Utah would be open to Tundra Swan hunting. The Service would continue to establish open seasons on Tundra Swans in parts of Montana and Nevada and throughout Utah while maintaining a "closed season" on Trumpeter Swans. Seasons could continue through the Sunday closest to January 20 and not exceed 100 days.

a. THE SWAN BASE

Trumpeter Swan: The Service would continue to participate in cooperative efforts to improve winter-range distribution of Trumpeter Swans within parts of the Pacific Flyway as described in Alternative 1. Should Trumpeter Swans enter Tundra Swan hunt areas, because of hazing or through pioneering, they would not be afforded additional protection associated with time or area restrictions on hunting opportunity. Those swans arriving in late winter would experience an increased risk of being killed during a Tundra Swan season. Such an unregulated harvest could possibly slow the rate of winter range expansion if enough Trumpeters were taken. The overall Trumpeter Swan population would continue to increase, and likely continue to exhibit annual fluctuations due to varying habitat conditions and other environmental factors. Impacts of this Alternative on Trumpeter Swans would be potentially the highest among all alternatives. Moreover, it would be difficult to track population impacts absent a monitoring program because Trumpeter Swans could not legally be taken, likely would have no or very reduced monitoring programs for harvest, and there would probably be less cooperation by States in Trumpeter Swan range-expansion projects.

Tundra Swan: The number and distribution of Tundra Swans would be largely unaffected by this action, with impacts anticipated to be similar to that described under Alternative 1.

Mute Swan: The number and distribution of Mute Swans would be largely unaffected by this action since very few birds occur in Utah, Montana or Nevada. The species would remain closed to take due to the recent court ruling that affords protection under the provisions of the MBTA.

b. THE SWAN HABITATS

Hazing, elimination of supplemental feeding, and other cooperative efforts to make current wintering habitats less hospitable (such as attempting to maintain very high or very low flow rates in the Henry's Fork) would continue. Due to concerns and doubts about the effectiveness of translocations, the Service will only support this activity on a limited, case-by-case basis and not as the preferred means of addressing the winter distribution problem. In summary, implementation of the portions of Alternative 2 dealing with swan harvest is not expected to have a significant affect on the habitats used by Trumpeter, Tundra or Mute Swans.

c. RECREATIONAL HUNTING IMPACTS

Not more than 500, 2,500, and 650 permittees in Montana, Utah, and Nevada, respectively, would be able to hunt. In Utah, the State-wide hunt would result in some hunting activity in places where swans are significantly less abundant, both spatially and temporally, than in the Great Salt Lake Basin.

The Service and State agencies could issue citations and prosecute Tundra Swan hunters who accidentally took Trumpeter or Mute Swans during an open season on Tundra Swans.

Hunters would have a significant disincentive to comply with harvest survey requirements because detection of a Trumpeter Swan by such methods would make them liable to prosecution.

c. AESTHETIC IMPACTS

Under this alternative, persons and NGOs interested in viewing swans will be impacted during the period of the swan season due to curtailed viewing opportunities. This will be for a relatively short period of time and opportunities for swan viewing will still be available in some locations. Areas potentially impacted would be greater than that described under Alternative 1 since there would be no specific area closures in habitats with significant Trumpeter Swan use. In summary, impacts will be short term and, although the number of Trumpeters harvested may increase, impacts on viewing opportunity are expected to be low. The number of Tundra Swans authorized to be taken is also low and would probably not be noticeable in terms of viewing opportunity or other aesthetic concerns.

NGOs and persons either opposed to swan hunting or who believe expedited winter-range expansion of Trumpeter Swans is possible would continue to be dissatisfied with the Tundra Swan seasons because of their belief that pioneering Trumpeter Swans would be killed.

Swans would continue to be discouraged from using wintering sites with limited food resources by hazing, and they would not be fed. Additionally, States may be reluctant to accept wintering swans because of uncertainties related to ongoing waterfowl seasons.

d. LOCAL ECONOMIC IMPACTS

Businesses would continue to provide equipment and services to hunters and agencies involved in swan restoration efforts.

3. ALTERNATIVE 3 - SEVERELY RESTRICT OR CLOSE TUNDRA SWAN HUNTING:

Under Alternative 3, the Service would either severely restrict or not allow open seasons on Tundra Swans in those parts of Montana, Utah, or Nevada that are likely to be used by

Trumpeter Swans. This may occur in situations where range expansion efforts prove successful, or where there is recent information on the occurrence of Trumpeter Swans. Seasons, if allowed, would be structured specifically to prevent any incidental take of Trumpeters Swans during Tundra Swan seasons. Depending on current and future swan distribution, this could lead to a situation where waterfowl hunting could be similar to that experienced by hunters in Utah prior to 1962, in Nevada prior to 1969, and in Montana prior to 1970, when waterfowl seasons were closed to the taking of any swan species.

a. THE SWAN BASE

Trumpeter Swan: The Service would continue to participate in cooperative efforts to improve winter-range distribution of Trumpeter Swans within parts of the Pacific Flyway. The risk of Trumpeter Swans being shot during a general waterfowl season would be significantly reduced because there likely would be no open season in areas where Tundra Swans and Trumpeter Swans are sympatric. Overall, the Service expects little numeric or distributional impact, positive or negative under this alternative, on Trumpeter Swans. The Service does not believe that curtailing or eliminating hunting opportunity will result in a significant increase in population status or distribution. This is largely due to the very low number of Trumpeter Swans that have been harvested historically.

Tundra Swan: The distribution of Tundra Swans would be largely unaffected by this action. Relative to the overall population status and trends of the WP of Tundra Swans, only minor impacts on the population are anticipated. The extent to which the population would increase due to the reduction in take is not known. Conceivably, if populations were to increase markedly beyond their current levels, adverse impacts associated with over-abundance might occur.

Mute Swan: The number and distribution of Mute Swans would be largely unaffected by this action since very few birds occur in Utah, Montana or Nevada. The species would remain protected by the Migratory Bird Treaty Act of 1918, as amended.

b. THE SWAN HABITATS

Hazing, elimination of supplemental feeding, and other cooperative efforts to make current wintering habitats less hospitable (such as attempting to maintain very high or very low flow rates in the Henry's Fork) would continue. Due to concerns and doubts about the effectiveness of translocations, the Service will only support this activity on a limited, case-by-case basis and not as the preferred means of addressing the winter distribution problem.

Hazing Trumpeter Swans from crowded wintering sites on the Henry's Fork of the Snake River has potential to allow habitats to recover from recent, excessive use by waterfowl. However, increasing numbers of Tundra Swans in some localities compete with Trumpeter Swans for winter-limited resources.

In summary, implementation of the portions of any Alternative dealing with swan harvest is not expected to have a significant affect on the habitats used by Trumpeter, Tundra or Mute swans.

c. RECREATIONAL HUNTING IMPACTS

If swan hunting was not allowed, it is expected that some swans would occasionally be illegally taken concurrent with waterfowl seasons. When detected, violators would be issued citations, prosecuted, and the dead swans confiscated. Due to difficulty in determining the difference between Tundra and Trumpeter Swans and the need to close areas used by Trumpeter Swans, recreational hunting opportunity would be greatly curtailed. Potentially, 3,150 hunters would be denied an opportunity to hunt swans.

d. AESTHETIC IMPACTS

This alternative would provide the greatest benefit to NGOs and persons opposed to swan hunting and NGOs supportive of Trumpeter Swan restoration efforts. Swan viewing opportunities would be enhanced since many areas used by swans would be closed to hunting.

In Idaho and Montana, hazing swans from over-crowded wintering sites would be continued as would the suspension of artificial feeding. Should the hazing program result in displacement of some swans to neighboring States, there would likely be some reluctance to accept hazed swans because of the impact of the program on traditional hunting opportunities.

e. LOCAL ECONOMIC IMPACTS

Businesses partially dependent upon swan hunters would have diminished sales. Some benefit might be derived from enhanced opportunities to view swans.

SUMMARY OF EFFECTS AMONG ALTERNATIVES

EFFECTS	Alt. 1. Restructured Swan Hunting Season	Alt. 2. No Action	Alt. 3. Severely Restrict or Close Swan Hunting
Winter Distribution of Trumpeter Swans	Risk to Trumpeter Swans potentially moving along Tundra Swan migration corridors in the Pacific Flyway would be controlled. Protection for Trumpeters would be enhanced due to early season closures and expanded area closures in Utah.	Trumpeter Swans will expand their winter range, but those moving into hunt areas in late winter would be at potential risk from up to 100-day swan seasons.	Trumpeters following Tundra Swan migration corridors would be at minimal risk from waterfowl hunting.
Trumpeter Swan Status	Trumpeter Swans would be legally taken but their number limited and monitored. Tristate group of swans would likely increase due to augmentation. They would remain subject to a die-off in SE Idaho but with less impact on the population. The Canadian group would continue to increase.	Trumpeter Swans would be shot accidentally during Tundra Swan seasons but the take mostly not monitored. Tristate group of swans would remain stable or decrease, and would be subject to a die-off in SE Idaho. The Canadian group would continue to increase.	The Tristate group of swans would remain stable or increase, but would be subject to a die-off in SE Idaho. The Canadian group would continue to increase.
Tundra Swan Status	Tundra Swans would continue to be harvested with the maximum take guided by a Flyway-approved harvest strategy but constrained by safeguards for Trumpeter Swans. Tundra Swan numbers would likely remain stable or increase should harvest be reduced.	Tundra Swans would continue to be harvested with the maximum take guided by a Flyway-approved harvest strategy. Tundra Swan numbers would likely remain stable or continue to increase.	If season was allowed, Tundra Swans could be taken but likely the total harvest would be reduced. Tundra Swan numbers likely would increase at a faster rate unless subsistence harvests were to increase.
Swan Hunting Opportunity & Success	Hunter numbers would be further reduced (3,150). Hunter days could be reduced or remain unchanged should hunters redirect their activities. Hunter success is likely to increase because effort will be concentrated in both time and area where Tundra Swans are most abundant. Season potentially would be terminated early by achieving quota of Trumpeter Swans.	A maximum of 3,650 permits would be authorized for hunters to hunt potentially 100 days between approximately October 1 and January 20. Montana hunters could hunt in all of Pondera and Teton Counties but not Chouteau County. Utah hunters could hunt state-wide.	Hunting opportunity for 3,650 hunters would be curtailed significantly and potentially eliminated depending on swan distribution.

Hunter Liability	Swan hunters taking a Trumpeter Swan could do so legally. Season would terminate should quota be obtained preventing additional take. Hunters taking swans following season closure would be subject to prosecution.	Swan hunters taking Trumpeter Swans would be subject to prosecution.	Should a season be allowed, swan hunters taking Trumpeter Swans would be subject to prosecution.
Public Attitudes	Hunters would be displeased with restrictions. Most NGOs and the public who do not support a balanced approach to either hunting or restoration would be displeased.	Hunters would be pleased with minimal restrictions and inconvenience but risk prosecution. Various NGOs would be dissatisfied with progress at enhancing Trumpeter Swan redistribution.	Hunters would be displeased. Various NGOs would be satisfied that progress was being made to enhance Trumpeter Swan redistribution; but some of those would be dissatisfied that it was done at the expense of hunting.
Costs to Hunters to Administer Programs	Potential added costs in fees to administer a more restricted program. Hunters may need to travel further to hunt; and they will be required to submit birds for examination in Utah and Nevada and report via postcard in Montana.	No additional costs in money or time.	If a season allowed, reduced costs and hunting opportunity. If season is closed, no costs and hunting opportunity will be eliminated.
Costs to Agencies to Administer Programs	Additional costs for obtaining hunter and harvest information data and enforcement related to general swan seasons. No additional costs in hazing, translocating, and monitoring Trumpeter Swans; but cost-effectiveness of effort potentially greater than Alternative 2 but less than Alternative 3.	Costs of obtaining hunter and harvest information data and enforcement of Tundra Swan seasons would be reduced as the Service and States would likely rely on normal LE efforts for enforcement, and not commit the additional resources required to operate check stations. Costs to haze, and monitor Trumpeter Swans would continue. Cost-effectiveness of effort would be potentially negated by unrestricted take of Trumpeter Swans.	Costs related to hunt dependent upon whether or not season is allowed. Costs to haze and monitor Trumpeter Swans would continue. Cost-effectiveness of effort potentially will be increased because the accidental take of Trumpeter Swans should be minimal.

4. UNAVOIDABLE ADVERSE IMPACTS AND MITIGATIVE MEASURES OF THE ALTERNATIVES

Under Alternative 1, some take of Trumpeter Swans would be authorized and such take is likely to occur. Under Alternative 2, some illegal harvest would likely occur in conjunction with Tundra Swan hunting because of the difficulties in distinguishing between the two species. Under Alternative 1, take of Trumpeters would be monitored and a quota

established and enforced to avoid take of more than 15 birds in Utah and Nevada. Mitigative measures, such as closure of areas known to have experienced take of Trumpeter Swans, reduction in the number of permits, and timing of the seasons, have been developed to lessen impacts on Trumpeter Swans. Implementation of these measures aids growth in the swan population and contributes to a positive working relationship with the various States involved in management by balancing competing needs for hunting and viewing Trumpeters. Continued growth in the Trumpeter Swan population throughout its range and the very low numbers of Trumpeters taken in past seasons are evidence that the current management approach is effective. This management scheme, when coupled with accelerated efforts to expand the breeding range through reintroduction and habitat management, is expected to lead to continued growth in RMP Trumpeter Swans.

V. SUMMARY OF COMMENTS AND SERVICE CONCLUSIONS

A. Comments and Service Response

Most comments received fall into the following two broad general categories: (1) those that support the Service proposal or believe it is too restrictive with regard to proposed hunting seasons under the preferred alternative, and (2) those who believe that the Service should prohibit all swan hunting in places where both Tundra and Trumpeter Swans may occur or simply prohibit all swan hunting.

The States of Wyoming, Oregon, Utah, Nevada, Idaho, 37 individuals and several hunting organizations wrote in support of continuation and/or expansion of existing swan hunting opportunities. The Trumpeter Swan Society (TTSS) submitted three concerns regarding the preferred alternative. The Fund for Animals (FFA), the Humane Society of the United States (HSUS), 430 individuals and several other animal protection organizations wrote in opposition to continued Trumpeter Swan hunting or swan hunting in general as proposed under the draft Environmental Assessment.

Comments of The Trumpeter Swan Society:

The Trumpeter Swan Society raised three specific issues with regard to the preferred alternative. These are presented below in abbreviated form along with the Service response:

1. The final EA needs to clearly explain how the Service will ensure that the 2001 constraints are not compromised by annual adjustments if operational status is granted. Further, TTSS suggests that the language “The Service will maintain all constraints in the 2001 EA at least until the Pacific Flyway’s 2002 short-term objectives for both the RMP/US breeding segment (614 adults) and for the RMP as a whole (5% annual growth) have both been achieved and maintained for 3 years,” be included in the final EA.

Upon consideration, the Service finds merit in the issue raised by the TTSS. In recognition that numbers of all animals fluctuate due to uncontrolled environmental conditions, the Service proposes to adopt their recommendation with a slight alteration as follows: regulations for the general swan hunt will be no less restrictive than those described in the 2001 Environmental Assessment until the three-year average number of Trumpeter Swans inventoried in the annual fall survey of the RMP/U.S. breeding segment is ≥90% of the of the goal (614 adults) specified in the Trumpeter Swan Implementation Plan. However, regulations may become more restrictive if evidence clearly suggests that the limits currently in place are negatively impacting the RMP or segments thereof. Status of the RMP and its segments will be reviewed annually and considered during the regulations-setting process. This statement has also been added to the description of the Preferred Alternative (pg. 8).

2. The EA fails to rectify the primary impact of the Utah swan hunt, which is that concerns for minimizing Trumpeter/hunt conflicts continue to prevent translocations of Trumpeter Swans to Bear River Refuge as called for in the Refuge's 1997 Comprehensive Management Plan.

This contention is, we believe, somewhat of a misrepresentation of the current view of the utility of translocations as established in this and previous Environmental Assessments (see pg. 5). TTSS does acknowledge that such actions would be dependent on both the State of Utah and the Pacific Flyway Council's cooperation. However, both the Service and the Flyway Council suspended general support of this technique, in large part based on their independent reviews of the report prepared by Shea and Drewien (1999). To date, the Service believes there is little evidence that transplanting swans can generate new migratory traditions, and the large number of apparent mortalities documented in past attempts with this technique is unacceptable to the Service. However, the Service notes a limited test of this technique in an experiment being conducted by the State of Idaho and cooperators, and will await the formal evaluation of the Idaho experiment prior to considering any further use of this approach. The Service would also note, as described in this EA, that we believe there are more effective and efficient ways of building migratory traditions (see pg. 5).

3. The final point raised by TTSS is with regard to an issue addressed by the Service at some length in both this and previous Environmental Assessments on this subject. That is, TTSS continues to recommend same-day check requirements for harvested swans in the Utah season.

The Service does not feel this requirement is justified and has addressed it at some length (pg 24-25). TTSS offers no evidence that the current approach is a problem or that there is a need to alter the current process. In response to criticism on this topic, and the contention by TTSS that the Executive Order establishing the refuge mandates same-day checks of hunters (reiterated on page 3 of their comments), the Service in 2001 requested a solicitor's opinion. The response we received indicated that same-day checks were not required, and that no legal procedures were necessary to change the checking procedure.

Further, the Service notes that it has increased monitoring efforts, especially at BRMBR, where approximately 80% of the annual swan harvest in Utah occurs. During the 2002-03 swan hunting season, the check station was staffed daily from the morning until the last hunter left the hunt area. That effort will be continued this year. However, such intensive monitoring is neither cost-effective nor necessary, as previously discussed, in areas or at times when swan hunting is infrequent, or where swan harvest is minimal.

Comments generally opposed to swan hunting and/or continuation of swan hunting seasons allowing the take of Trumpeter swans.

A number of comments were received that would be categorized as opposed to swan hunting in general, or more specifically opposed to allowing the legal take of Trumpeter swans. These comments are addressed as follows:

As previously stated, the Service supports Tundra Swan hunting where and when their population status warrants such activity and Flyway management plans (including harvest management guidelines) have been developed to ensure the long term welfare of these populations. The continued growth of the Western Population of Tundra Swans during the past several decades supports the Service position that harvest and population maintenance and enhancement are not inconsistent. The Service will continue to authorize and support swan hunting seasons that meet these guidelines.

Many comments continue to refer to Trumpeter Swans as either endangered or a threatened species and use this status as the basis for recommending that no harvest of Trumpeter Swans be allowed. Trumpeter Swans are not, nor have they ever been, listed as either a threatened or endangered species. The three presently recognized populations continue to grow steadily and their geographic range continues to expand under cooperative programs conducted throughout North America to restore this species to its historic range (Fig. 1). These statements regarding status are not intended to imply that the Service considers Trumpeter Swan restoration efforts complete. The Service will continue to actively promote efforts to increase Trumpeter Swan numbers throughout North America, to improve the status of some regional aggregations of birds (for example, the Tri-state Area flocks), and to work to establish new migratory Trumpeter Swan populations when possible. As an example, the Service has funded the propagation of approximately 40 cygnets for release in the Tristate Area in the near future. The Service would not concur with the position that all harvest of this species should be precluded based on their present population status, but certainly intends to enforce strict limits on the take of Trumpeter Swans during the general swan seasons, the absence of which may hinder continued growth and expansion of Trumpeter Swans. The Service issued a 90-day finding that concluded that the segment of the population that was proposed for listing (Tri-state Area flocks) did not constitute a listable entity (*Federal Register* 68(18): 4221-4228).

As Trumpeter Swan restoration efforts continue, additional overlap between the two species in areas open to Tundra Swan hunting can reasonably be expected. The Service does not believe that the occasional harvest of a Trumpeter Swan in an existing general

swan season (which is intended to target Tundra Swans) should preclude such seasons since such harvest would have very little impact on the health or population status of any Trumpeter Swan population. Additionally, the Service does not propose to establish any hunting seasons specifically for Trumpeter Swans anywhere in the United States. Rather, the Service will require monitoring that is sufficient to determine specific locations where and when any harvest of Trumpeter Swans might occur during swan seasons, and to adjust swan season frameworks, where necessary, to protect Trumpeter swan populations, but not individuals. Although several comments suggest that the burden for protecting Trumpeter swans during swan seasons should be placed on individual hunters, the Service does not feel such an approach is reasonable, feasible or necessary. Differentiating Tundra and Trumpeter Swans in the field has been described by Patten and Heindel (1994) as "perhaps the most underrated field identification problem in North America." The Service does not feel regulations requiring hunters to make such judgements under field conditions are likely to be effective. However, the Service strongly supports and encourages hunter-education efforts to improve hunter identification and to reduce unintentional Trumpeter Swan harvest and is very encouraged that the training requirement instituted by the State of Utah will help address this issue. Likewise, the Service does not believe that hunters should be held liable for the unintentional harvest of a Trumpeter Swan. The Service believes that required harvest monitoring programs, establishment of limited quotas on Trumpeter Swan harvest, and general swan hunting season adjustments can provide sufficient protection to expanding Trumpeter Swan populations while maintaining traditional Tundra Swan hunting opportunities. As previously stated by the Service, where conflicts arise, the Service will examine and deal with such situations on a case-by-case basis.

In addition to the more general comments, both HSUS and FFA wrote in opposition to the preferred alternative.

1. The Humane Society wrote in support of Alternative 3, close Tundra Swan hunting in Trumpeter swan habitat. In summary, HSUS essentially offers three points in support of choosing Alternative 3: (1) The status of Tristate Trumpeter Swans, (2) the need to protect even a single pioneering Trumpeter Swan, and (3) the potential for hunters not to participate in swan monitoring.

The points raised by the HSUS are addressed in the Final Environmental Assessment as follows: (1) pages 11-14, (2) pages 22-24, and pages (3) 24-26. These same points were also addressed in the draft. The Service appreciates the obvious and careful consideration given by HSUS to this issue. The Service believes it has carefully considered all of these points and does not concur with their recommendation for all of the reasons presented in the final EA. Based on our assessment of the information, the Service believes implementation of the Preferred Alternative poses no significant threat to Trumpeter Swans in general, nor to any component of the recognized Rocky Mountain Population of Trumpeter Swans.

The FFA submitted a number of comments, most of which are not new, and most of which were not substantiated by the recent District Court ruling on this issue. The Service notes that it has prepared this Environmental Assessment in light of the most recent court rulings on this issue.

Comments requesting further expansion of swan hunting seasons.

One State, and several hunters and hunting groups wrote requesting expanded hunting opportunity.

A. The State of Utah requested adjustment of the framework closing date for the swan season in Utah, from the second Sunday in December to a fixed closing date of December 15. In addition, the State of Utah indicated that it was of the belief that the closure of the areas north of BRMBR imposed in the 2001 EA was unwarranted, and that they would likely request these areas be reopened shortly as well as restoration of the permits that were removed from their allotment at that time. Several Utah hunters requested the areas recently closed be reopened now.

As stated above in the Service response to TTSS, the Service believes the current season structure and configuration should remain essentially unchanged until such time that the RMP/U.S. breeding segment is nearer the Flyway management goals. Further, the Service wants both hunting proponents and opponents to clearly understand, that, should Trumpeter Swan population numbers, or numbers in individual flocks within the RMP of Trumpeter Swans decline, the Service will consider further restrictions to these seasons.

B. SERVICE CONCLUSIONS

In conclusion, the Service has independently assessed the information available and has concluded that the Preferred Alternative will not significantly impact Trumpeter, Tundra or Mute Swans in the Pacific Flyway. The relatively small number of Trumpeter Swans that the Service expects to be harvested by this action will not pose a significant risk to either the Rocky Mountain Population as a whole, or any segment of this population that has been identified by others to this point. Additionally, the Service expects few if any Mute Swans to be harvested in these seasons and most Mute Swans in the Pacific Flyway are found in States that do not have swan hunting seasons. The Service recognizes that there are many challenges still present in developing and implementing a broad-scale management program for Trumpeter Swans in the Pacific Flyway. The Service will continue to work with stakeholders to ensure the continued growth of this population. The Service is committed to meeting the goals and objectives of the 1998 Pacific Flyway Management Plan for this population of Trumpeter Swans, including all of the Regional- and State-specific objectives. The Service is strongly committed to maintaining and enhancing Trumpeter Swan numbers throughout the Tristate Region, including those associated with Yellowstone National Park, and should new evidence become available that suggests that efforts to maintain and enhance these Trumpeter Swans are being jeopardized by existing hunting seasons, the Service will modify or suspend these seasons to ensure no adverse impacts are

manifested. The Service does not find the existing evidence to be supportive of the contention of some parties that these existing seasons are currently having a significant impact either numerically or in influencing winter distributions of Trumpeter Swans. In addition, the Service feels the active program proposed for direct augmentation of the Core Tristate Area will offset any potential negative impacts caused by adopting the preferred alternative.

VI. CONSULTATION AND COORDINATION

This Environmental Assessment is an expanded and revised version of three previous Environmental Assessments (Bartonek et al. 1995, Trost et al. 2000, Trost et al. 2001). Extensive consultations were conducted in the development and implementation of these original Environmental Assessments. Previous consultations are summarized in those documents. Service representatives have conducted discussions in conjunction with annually scheduled Flyway meetings and at the Trumpeter Swan Society Conference, September 15-18, 1999, in Idaho Falls, Idaho, and again in Vancouver, British Columbia, in February 2003, where this issue was discussed at length. Additional input has been received from numerous groups and organizations. Two public meetings were held in Idaho Falls, Idaho and Salt Lake City, Utah, specifically to accept public comments on the Supplemental Environmental Assessment prepared for the 2000-2001 hunting season. The Service met with members of the Bureau of Reclamation, the National Park Service, and representatives of the Biological Resources Division of USGS to discuss matters pertaining to this assessment in May of 2001. The Service has continued to receive comment on the issue of management of RMP Trumpeter Swans from various public and private sources and has considered those comments in preparing this assessment. The Service has responded in detail to many of the specific comments previously (Trost et al. 2001) and by reference incorporates those responses here as well.

A. ENDANGERED SPECIES

Consultation under Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.), has not been sought in development of this proposal but will be done during the regulatory process to develop frameworks for the 2003-2004 Migratory Game Bird Hunting Regulations. The proposed action is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of their critical habitats. Hunting regulations are designed, among other things, to remove or alleviate chances of conflict between seasons for migratory game birds and the protection and conservation of endangered and threatened species and their habitats. The Service's biological opinions resulting from its consultation under Section 7 are considered public documents and are available for inspection in the Division of Endangered Species and the Division of Migratory Bird Management.

B. NEPA

NEPA considerations associated with the annual regulation-setting process are covered by the programmatic document, ``Final Supplemental Environmental Impact Statement: Issuance of Annual Regulations Permitting the Sport Hunting of Migratory Birds (FEIS 88-14),'' filed with EPA on June 9, 1988. Notice of Availability was published in the *Federal Register* on June 16, 1988 (53 FR 22582). The Service's Record of Decision was published on August 18, 1988 (53 FR 31341). However, this programmatic document does not prescribe year-specific regulations; those are developed annually. The annual regulations and options that will be considered in the Environmental Assessment, which will assess the environmental impacts associated with development of the ``Waterfowl Hunting Regulations for 2003,'' will be available in September of 2003, and each September thereafter.

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VII. REFERENCES

American Ornithologists' Union. 1983. Check-list of North American Birds. 7th Edition. American Ornithologist's Union, Washington, D.C.

Banko, W. E. 1960. The Trumpeter Swan, its history, habits and population in the United States. North American Fauna Number 63. U. S. Fish and Wildlife Service. U.S. Government Printing Office, Washington D.C.

Bartonek, J. C., R. Kokel, R. J. Blohm, and P. R. Schmidt. 1995. Environmental Assessment: Proposal to establish general swan hunting seasons in parts of the Pacific Flyway for the 1995-99 seasons. USFWS. 35pp. (plus appendices).

Bouffard, S. H. 2000. Recent changes in winter distribution of RMP Trumpeter Swans. Pages 53-59 *in* Shea, R. E., M.H. Linck, and H. K. Nelson, eds. Proceedings and papers of the Seventeenth Trumpeter Swan Society Conference.

Cada, J.D. 1983. Evaluations of the telephone and mail survey methods of obtaining harvest data from licensed sportsmen in Montana. Pages 117-128 in S.L. Beasom and S.E. Roberson, eds. Game harvest management. Caesar Kleberg Res. Inst., Kingsville, Texas.

Caithamer, D. F. 2001. Trumpeter Swan population status, 2000. U.S. Fish and Wildlife Service, Division of Migratory Bird Management. 14pp.

Dubovsky, J. A. 2003a. Trumpeter Swan survey of the Rocky Mountain Population: Fall 2002 (as amended). U. S. Fish and Wildlife Service, Migratory Bird and State Programs, Lakewood Colorado. 17pp. (plus figures and tables).

Dubovsky, J. A. 2003b. Trumpeter Swan survey of the Rocky Mountain Population: Winter 2003. U. S. Fish and Wildlife Service, Migratory Bird and State Programs, Lakewood Colorado.

Gritman, J. C. 1991. Keynote Address: Twelfth Trumpeter Swan Society Conference. Pages 3-4 in J. V. Englund, ed. Proceedings and papers of the Twelfth Trumpeter Swan Society Conference.

Hartwig, W. L. 1989. Memorandum from Assistant Director - Refuges and Wildlife to Regional Directors, Regions 1-8, Subject: “Trumpeter Swan Policy.” U.S. Fish and Wildlife Service, Washington, DC.

Hayward, C. L., C. Cottam, A. M. Woodbury, and H. H. Frost. 1976. Birds of Utah. Great Basin Naturalist Memoirs. Number 1. Brigham Young University Press. Provo, Utah. 229 pp.

Hemker, T.P. In press. The Trumpeter Swan Implementation Plan: An overview. Proceedings and papers of the Eighteenth Trumpeter Swan Society Conference.

Mackay, R. H. 1957. Movements of trumpeter swans shown by band returns and observations. Condor. Vol. 59. No. 5.

Olson, D. 2001. Mid-winter survey of the Rocky Mountain Population of Trumpeter Swans. U.S. Fish and Wildlife Service, Red Rocks Lakes National Wildlife Refuge, Lima, Montana. 7pp. (plus figures and tables).

Pacific Flyway Council. 1998. Pacific Flyway Management Plan for the Rocky Mountain Population of Trumpeter Swans. Pacific Flyway Study Committee [c/o Pacific Flyway Representative, USFWS, Portland, OR], Portland, OR. 74pp.

Pacific Flyway Council. 2002. Pacific Flyway Implementation Plan for the Rocky Mountain Population of Trumpeter Swans. Pacific Flyway Study Committee [c/o Pacific Flyway Representative, USFWS, Portland, OR], Portland, OR. 27pp.

Patten, M. A. and M. T. Heindel. 1994. Identifying Trumpeter and Tundra Swans. Birding 29:306-318.

Rupp, S.P., W.B. Ballard, and M.C. Wallace. 2000. Nationwide evaluation of deer hunter harvest survey techniques. Wildl. Soc. Bull. 28(3):570-578.

Rusch, D. H., S. R. Craven, R. E. Trost, J. R. Cary, R. E. Drieslein, J. W. Ellis, and J. Wetzel. 1985. Evaluation of efforts to redistribute Canada geese. Trans. N. Amer. Wildl. Conf. 50:506-524.

Schmidt, P. 2000. Challenges in conserving swans and other migratory birds into the next millennium. North American Swans 29:41-43.

Shea, R. E. and R. C. Drewien. 1999. Evaluation of efforts to redistribute the Rocky Mountain Population of Trumpeter Swans, 1986-97. Unpublished report. 51pp. (pus figures and tables).

Subcommittee on Rocky Mountain Trumpeter Swans. 1998. Pacific Flyway Management Plan for the Rocky Mountain Population of Trumpeter Swans. Pacific Flyway Study Committee [c/o Pacific Flyway Representative, USFWS, Portland, OR]. 74pp.

Subcommittee on Tundra Swans. 2001. Pacific Flyway Management Plan for the Western Population of Tundra Swans. Pacific Flyway Study Comm. [c/o USFWS, DMBM] Portland, Oreg. Unpubl. rept.

Subcommittee on Whistling Swans. 1983. Pacific Flyway Management Plan for the Western Population of Whistling Swans. Pacific Flyway Study Comm. [c/o USFWS, MBMO] Portland, Oreg. Unpubl. rept.

Taylor, C.E., D.L. Otis, H.S. Hill, Jr., and C.R. Ruth. 2000. Design and evaluation of mail surveys to estimate deer harvest parameters. Wildl. Soc. Bull. 28(3): 717-723.

Trost, R. E., M. S. Drut, S. H. Bouffard, J. E. Cornely, J. B. Bortner, and D. Gomez. 2000. Evaluation of: Environmental Assessment: Proposal to establish general swan hunting seasons in parts of the Pacific Flyway for the 1995-99 seasons. U.S. Fish and Wildlife Service, Division of Migratory Bird Management. 14pp. (plus tables and figures).

Trost, R. E., R. J. Blohm, and J. Andrew. 2000. Supplemental Environmental Assessment: Proposal to establish operational general swan hunting seasons in the Pacific Flyway. USFWS. 35pp. (plus appendices).

Trost, R. E. J.Andrew, R. J. Blohm. 2001. Environmental Assessment: Proposal to establish operational/experimental general swan hunting seasons in the Pacific Flyway. USFWS. 55pp. (plus tables, figures, and appendicies).

USDI. 1988. Final Supplemental Environmental Impact Statement: Issuance of annual regulations permitting the sport hunting of migratory birds. U.S. Fish Wildl. Serv., Wash., D.C. 339 pp.

Whitman, C. 2002. Causes of trumpeter swan mortalities observed in southwestern Montana, eastern Idaho, and northwestern Wyoming during the winters of 2000 and 2001. Unpublished report. U.S. Fish and Wildlife Service, Southeast Idaho Refuge Complex, Pocatello. 8pp. plus tables.

Table 1a. Seasons, hunter participation, and harvests of the Western Population of Tundra swans in the Pacific Flyway.

	Season Frameworks a			Number of Permits				Harvest			% Gray
	Earliest	Latest	Max. No.	Author-	Applic-		Hunter-				Swans in
Year	Opening	Closing	Days	ized	ation	Issued	days	Retrvd	Unretrvd	Total	Harvest
1962 b	06-Oct-62	06-Jan-63	75	1,000	--	1,000	--	320	81	401	38
1963 b	05-Oct-63	05-Jan-64	90	1,000	1,519	1,000	--	392	62	454	48
1964 b	10-Oct-64	10-Jan-65	90	1,000	1,599	1,000	4,600	335	86	421	37
1965 b	09-Oct-65	09-Jan-66	90	1,000	2,495	995	4,700	336	60	396	45
1966 b	08-Oct-66	08-Jan-67	90	1,000	2,294	1,000	4,000	491	75	566	42
1967 b	07-Oct-67	07-Jan-68	90	1,000	2,766	1,000	4,800	246	69	315	54
1968 b	05-Oct-68	12-Jan-69	86	1,000	4,342	1,000	4,300	520	102	622	58
1969 c	04-Oct-69	11-Jan-70	86	3,000	6,346	3,000	11,410	1,377	266	1,643	62
1970 d	03-Oct-70	17-Jan-71	93	3,500	8,170	3,500	14,100	1,199	170	1,369	55
1971 d	02-Oct-71	16-Jan-72	93	3,500	6,833	3,495	13,670	1,109	175	1,284	33
1972 d	Sat. Closest Oct 1	Sun. Closest Jan 20	93	3,500	7,634	3,500	13,854	1,028	118	1,146	36
1973 d	Sat. Closest Oct 1	Sun. Closest Jan 20	93	3,500	6,805	3,500	11,605	1,191	257	1,448	49
1974 d	Sat. Closest Oct 1	Sun. Closest Jan 20	93	3,500	8,431	3,500	13,977	1,377	298	1,675	43
1975 d	Sat. Closest Oct 1	Sun. Closest Jan 20	93	3,500	10,180	3,500	13,069	1,383	241	1,624	40
1976 d	Sat. Closest Oct 1	Sun. Closest Jan 20	93	3,500	10,163	3,500	12,032	1,109	164	1,273	40
1977 d	Sat. Closest Oct 1	Sun. Closest Jan 20	93	3,500	9,413	3,488	--	1,575	347	1,922	51
1978 d	Sat. Closest Oct 1	Sun. Closest Jan 20	93	3,500	10,985	3,500	10,613	1,152	375	1,527	44
1979 d	Sat. Closest Oct 1	Sun. Closest Jan 20	93	3,500	9,661	3,500	11,551	1,293	345	1,638	39
1980 d	Sat. Closest Oct 1	Sun. Closest Jan 20	93	3,500	10,943	3,500	10,950	1,156	223	1,379	48
1981 e	Sat. Closest Oct 1	Sun. Closest Jan 20	93	3,500	7,798	3,500	10,756	1,619	377	1,996	36
1982 e	Sat. Closest Oct 1	Sun. Closest Jan 20	93	3,500	8,385	3,500	12,743	1,244	311	1,555	36
1983 f	Sat. Closest Oct 1	Sun. Closest Jan 20	93	3,650	6,848	3,650	12,452	1,168	286	1,454	43
1984 f	Sat. Closest Oct 1	Sun. Closest Jan 20	93	3,650	6,259	3,650	13,037	1,194	126	1,320	38
1985 f	08-Oct-85	13-Jan-86	79	3,650	5,991	3,645	13,527	673	97	770	32
1986 f	04-Oct-86	11-Jan-87	79	3,650	4,246	3,608	12,884	947	185	1,132	37
1987 f	03-Oct-87	10-Jan-88	79	3,650	3,944	3,593	13,519	600	66	666	33
1988 g	Sat. Closest Oct 1	Sun. Closest Jan 20	93	3,650	2,729	3,260	9,656	839	123	962	36
1989 g	Sat. Closest Oct 1	Sun. Closest Jan 20	93	3,650	2,790	3,324	10,330	1,077	188	1,265	37
1990 g	Sat. Closest Oct 1	Sun. Closest Jan 20	93	3,650	3,416	3,297	10,199	1,216	177	1,393	32
1991 g	Sat. Closest Oct 1	Sun. Closest Jan 20	93	3,650	4,218	3,258	9,469	915	168	1,083	42
1992 g	Sat. Closest Oct 1	Sun. Closest Jan 20	93	3,650	3,943	3,100	10,464	700	50	750	30
1993 h	Sat. Closest Oct 1	Sun. Closest Jan 20	100	3,650	4,006	3,205	14,409	673	72	745	29
1994 h	Sat. Closest Oct 1	Varies i	100	3,650	4,499	3,206	11,279	1,182	151	1,333	29
1995 j	Sat. Closest Oct 1	Varies k	79	3,900	4,967	3,633	14,997	602	103	705	39
1996 j	Sat. Closest Oct 1	Varies k	79	3,900	4,391	3,626	12,698	1,318	281	1,599	31
1997 j	Sat. Closest Oct 1	Varies k	79	3,900	5,125	3,631	12,826	1,135	266	1,401	33
1998 j	Sat. Closest Oct 1	Varies k	79	3,900	5,368	3,742	11,973	1,603	354	1,957	24
1999 j	Sat. Closest Oct 1	Varies k	79	3,900	6,490	3,768	11,485	1,297	244	1,541	26
2000 j	Sat. Closest Oct 1	Varies l	79	3,150	5,869	2,993	9,983	845	141	986	20
2001j	Sat. Closest Oct 1	Varies l	79	3,150	5,482	2,808	9,092	600	89	689	17
2002j	Sat. Closest Oct 1	Varies l	79	3,150	4,135	2,800	8,957	692	180	872	31

a Framework dates and season lengths apply to Utah, Nevada, and Montana.

b Hunting in Utah (statewide).

c Hunting in Utah (statewide); Nevada (Churchill Co.).

d Hunting in Utah (statewide); Nevada (Churchill Co.); Montana (Teton Co.).

e Hunting in Utah (statewide); Nevada (Churchill Co.); Montana (Teton and Cascade Cos.).

f Hunting in Utah (statewide); Nevada (Churchill, Lyon, and Pershing Cos.); Montana (Teton and Cascade Cos.).

g Hunting in Utah (statewide); Nevada (Churchill, Lyon, and Pershing Cos.); Montana (Teton, Cascade, Toole, Liberty, Hill, and Pondera Cos.); Alaska (GMU 22).

h Hunting in Utah (statewide, except for Cache, Rich, Daggett, and Unitah Cos.); Nevada (Churchill, Lyon, and Pers
Liberty, Hill, and Pondera Cos.); Alaska (GMU 22 and 18).

i Utah season ends by Dec. 15. Elsewhere, Sunday closest to Jan. 20.

j Hunting in Utah (Great Salt Lake Basin); Nevada (Churchill, Lyon, and Pershing Cos.); Montana (Cascade, Chouteau, Hill, Liberty, Toole,
and portions of Pondera and Teton Cos.).

k Utah season ends first Sunday in Dec.; Nevada season ends first Sunday after Jan. 1; Montana season ends no later than Dec. 1.

l Utah season ends second Sunday in Dec.; Nevada season ends first Sunday after Jan. 1; Montana season ends no later than Dec. 1.

Table 1b: Season length, hunter activity and harvest of tundra swans in the Pacific Flyway portion of Montana.

Season	Season Length in Days	Number of Applications Received	Number of Permits Issued *	Percent of Permittees Hunting	Estimated Number of Hunter Days	Estimated Retrieved Harvest	Estimated No. Knocked down & Unretrieved	Percent Gray Swan in Bag
1970	93	500	500	55	1,130	179		41
1971	93	500	500	49	1,128	91		33
1972	93	500	500	53	1,122	150		31
1973	93	500	500	46	757	101	11	45
1974	93	500	500	70	1,217	259	56	48
1975	93	616	500	70	874	266	37	34
1976	93	604	500	76	969	139	12	43
1977	93	678	500			214	26	35
1978	93	790	500	70	571	146	19	37
1979	93	708	500	78	1,119	275	62	32
1980	93	912	500	80	965	250	22	41
1981	93	972	500	66	703	177	17	30
1982	93	739	500	68	799	139	9	27
1983	93	689	500	75	931	218	17	40
1984	93	601	500	61	414	221	6	25
1985	79	648	500	55	596	185	12	21
1986	79	705	500	54	756	200	16	26
1987	79	841	500	79	829	280	23	32
1988	93	697	500	71	722	260	19	29
1989	93	867	500	80	779	302	38	29
1990	93	918	500	74	749	275	20	27
1991	79	864	500	37	444	79	7	35
1992	79	804	500	73	817	221	6	20
1993	79	760	500	76	1,191	290	28	30
1994	79	824	500	81	730	326	24	27
1995	49	1,088	500	68	765	182	13	30
1996	49	1,074	500	83	843	302	23	22
1997	49	1,295	500	79	709	300	57	24
1998	49	1,564	500	83	917	276	47	20
1999	47	1,647	500	78	1,033	226	13	17
2000	49	1,447	500	60	670	217	29	17
2001	50	1,328	500	68	930	289	29	10
2002	51	1,528	500	61	606	167	15	21

*Permits provided on a first-come, first-served basis 1970-74.

Note: Hunting of swans allowed only in Teton county 1970-80, Teton & Cascade 1981-87, Toole, Liberty, Hill, Pondera, Teton and Cascade 1988-94; a portion of Teton & Pondera Co.'s were closed and Chouteau Co. was opened in 1995. In 1995 the season ending framework in Montana was shortened to Dec 1.

** In 1997, definition of crippled bird broadened to include any bird visibly hit that you could not retrieve.

Table 1c: Season length, hunter activity and harvest of tundra swans in Nevada.

Season	Season Length in Days	Number of Applications Received	Number of Permits Issued *	Percent of Permittees Hunting	Estimated Number of Hunter Days	Estimated Retrieved Harvest	Estimated No. Knocked down & Unretrieved	Percent Gray Swan in Bag
1969	58		500		1,410	87		63
1970	65		500		1,370	208		49
1971	58	510	500	83	1,475	102		37
1972	65	571	500	80	1,635	124		34
1973	65	686	500	75	1,315	109	10	47
1974	72	534	500	77	1,455	190	25	39
1975	65	690	500	78	1,123	188	35	38
1976	65	682	500	82	1,378	206	21	34
1977	72	638	500	76	1,326	84	10	46
1978	65	621	500	74	1,407	90	4	47
1979	72	604	500	78	1,314	214	42	32
1980	65	767	500	79	1,428	103	16	31
1981	65	500	500	89	1,115	301	49	32
1982	79	534	500	80	1,200	161	22	20
1983	79	650	650	78	1,833	169	24	29
1984	79	650	650	76	1,618	229	22	31
1985	72	650	650	67	1,381	145	12	34
1986	79	608	608	79	1,530	196	58	34
1987	79	594	594	68	1,694	94	11	38
1988	93	260	260	75	770	78	4	49
1989	93	324	324	78	1,076	81	4	37
1990	93	297	297	78	994	67	6	36
1991	93	258	258	70	721	62	2	47
1992	93	100	100	71	242	29	2	36
1993	100	205	205	66	668	46	3	31
1994	100	206	206	78	601	88	7	43
1995	79	383	383	75	1,224	72	20	41
1996	79	376	376	88	1,054	119	17	37
1997	79	381	381	86	1,282	131	16	38
1998	79	492	492	85	1,552	185	24	16
1999	79	518	518	84	1,815	213	19	31
2000	79	509	493	62	1,288	78	7	41
2001	79	308	308	78	1,171	62	3	19
2002	79	264	264	69	886	45	6	27

*Permits provided on a first-come, first-served basis 1969-70.

Note: Hunting of swans allowed only in Churchill county 1969-82, Churchill, Lyon and Pershing counties 1983 to present. In 1995 the season ending framework was shortened to the sunday following December 1.

Table 1d: Season length, hunter activity and harvest of tundra swans in Utah.

Season	Season Length in Days	Number of Applications Received	Number of Permits Issued *	Percent of Permittees Hunting	Estimated Number of Hunter Days	Estimated Retrieved Harvest	Estimated No. Knocked down & Unretrieved	Percent Gray Swan in Bag
1962	68		1,000			320	81	38
1963	90	1,519	1,000			392	62	48
1964	90	1,599	1,000	94	4,600	335	86	37
1965	90	2,495	995	92	4,700	336	60	45
1966	90	2,294	1,000	95	4,000	491	75	42
1967	90	2,766	1,000	91	4,800	246	69	54
1968	86	4,342	1,000	93	4,300	520	102	58
1969	86	6,346	2,500	89	10,000	1,290	266	62
1970	93	7,670	2,500	88	11,600	812	170	52
1971	93	5,823	2,495	86	11,067	916	175	33
1972	93	6,563	2,500	84	11,097	754	118	38
1973	93	5,619	2,500	87	9,533	981	236	50
1974	93	7,397	2,500	88	11,305	928	217	42
1975	93	8,874	2,500	87	11,072	929	169	46
1976	93	8,877	2,500	86	9,685	764	131	41
1977	93	8,097	2,488	91	8,411	1,277	311	54
1978	93	9,574	2,500	86	8,635	916	352	45
1979	93	8,349	2,500	86	9,118	804	241	43
1980	93	9,264	2,500	84	8,557	803	185	52
1981	93	6,326	2,500	89	8,938	1,141	311	38
1982	93	7,112	2,500	88	10,744	944	280	40
1983	93	5,509	2,500	85	9,688	781	245	47
1984	86	5,008	2,500	86	11,005	744	98	44
1985	79	4,693	2,495	81	11,550	343	73	37
1986	79	2,933	2,500	83	10,598	551	111	42
1987	79	2,509	2,499	77	10,996	226	32	33
1988**	86	1,772	2,500	75	8,164	501	100	37
1989**	88	1,599	2,500	77	8,475	694	146	40
1990**	93	2,201	2,500	82	8,456	874	151	33
1991	93	3,096	2,500	78	8,304	774	159	42
1992	93	3,039	2,500	75	9,405	450	42	31
1993	94	3,041	2,500	81	12,550	337	41	28
1994	69	3,469	2,500	84	9,948	768	120	29
1995	58	3,496	2,750	79	13,008	348	70	41
1996	58	2,941	2,750	87	10,801	897	241	31
1997	65	3,449	2,750	87	10,835	704	193	35
1998	65	3,312	2,750	88	9,504	1,142	283	25
1999	65	4,325	2,750	85	8,637	858	212	26
2000	65	3,913	2,000	84	8,025	550	105	19
2001	65	3,846	2,000	78	6,991	249	57	21
2002	65	2,343	1,998	83	7,465	480	85	34

*Permits provided on a first-come, first-served basis in 1962.

**Permits were undersubscribed, but all were eventually sold over counter.

Note: Hunting of swans was statewide 1962-93, in 1994 swan hunting was closed in Cache, Daggett, Rich and Uintah counties and season frameworks were shortened to December 15.

In 1995 swan hunting was allowed only in the Great Salt Lake vicinity, and season frameworks were shortened to the first sunday in December.

In 2000 swan hunting was allowed only in that portion of the Great Salt Lake vicinity south of the North boundary of the Bear River Refuge, and the season closing framework was extended to the second Sunday in December, and permit numbers were reduced to 2000.

Table 2. Estimated swan harvest in the Pacific Flyway States of Utah, Nevada, and Montana, 1994-2002.

	Tundra Swan Harvest Estimate			Swan Examined			Compliance Rate (a)			Trumpeters Detected (b)		
Year	Utah	Nevada	Montana	Utah	Nevada	Montana	Utah	Nevada	Montana	Utah (c)	Nevada	Montana
1994	768	88	326	474	78	219	61.7%	88.6%	67.2%	0	0	1
1995	348	72	182	244	66	110	70.1%	91.7%	60.4%	3	0	3
1996	897	119	302	701	110	181	78.1%	92.4%	59.9%	7	1	3
1997	704	131	300	497	116	217	70.6%	88.5%	72.3%	3	0	1
1998	1142	185	276	879	156	168	77.0%	84.3%	60.9%	1	0	3
1999	858	213	226	647	186	153	75.4%	87.3%	67.7%	0	0	7
2000	550	78	217	454	65	203	82.5%	83.3%	93.5%	1	0	3
2001	249	62	289	229	52	244	92.0%	83.9%	84.4%	0	0	0
2002	480	45	167	453	40	141	94.4%	88.9%	84.4%	2	0	3
Total	5996	993	2285	4578	869	1636	76.4%	87.5%	71.6%	17	1	24

a Compliance Rate = Swans Examined/Estimated Tundra Swan Harvest

b Criteria for Trumpeter Detection = Ad w/o yellow lore and posterior nare and posterior nare to bill tip > or = 61mm.

c In 1996, 6 of the 7 Trumpeters detected in Utah's harvest were swans mark released in Utah as part of a research proposal. The other was a marked swa Oregon 2 years earlier.

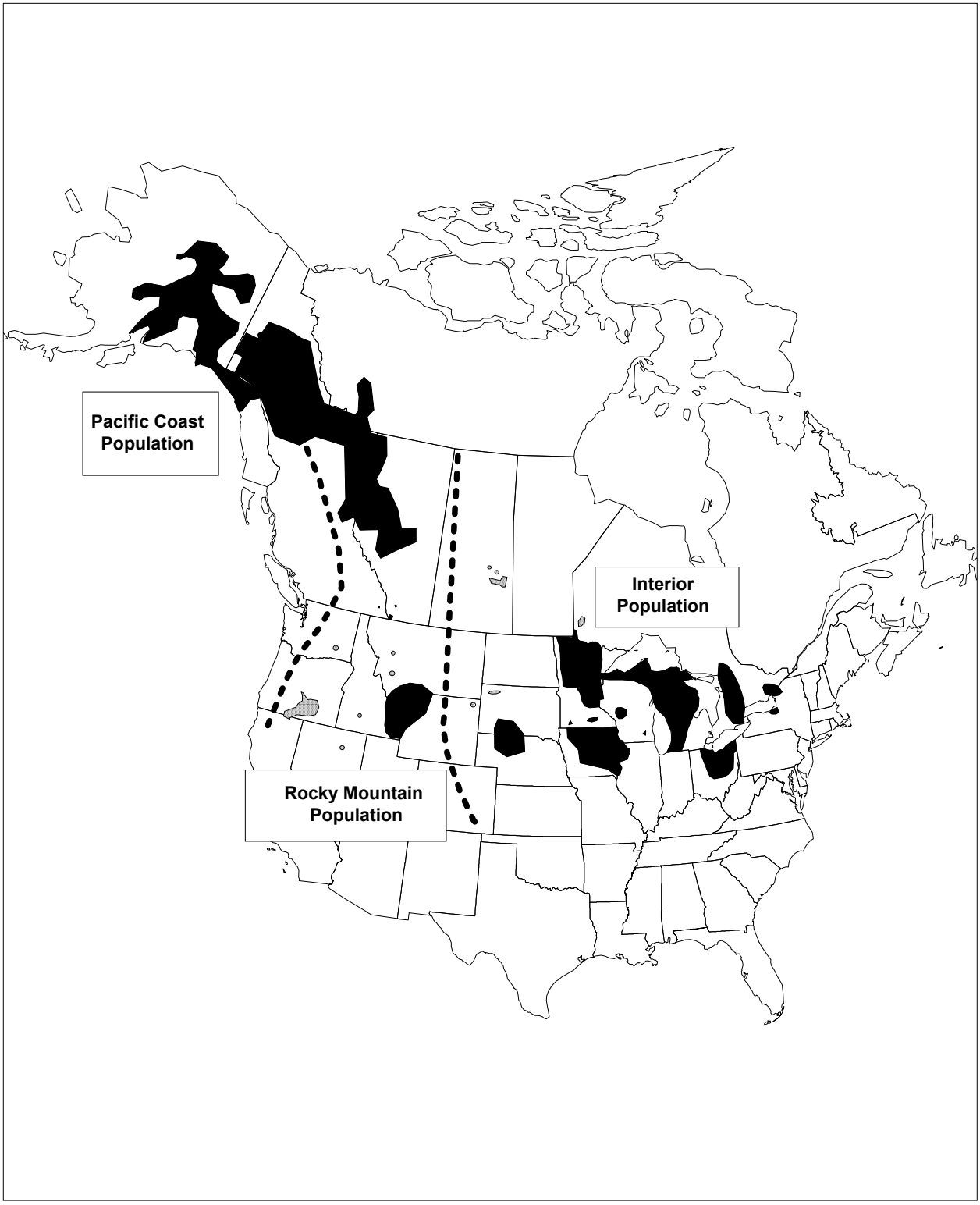


Figure 1. Approximate ranges of the 3 management populations of Trumpeter Swans, Pacific, Rocky Mountain, and Interior, in North America during late-summer 2000.

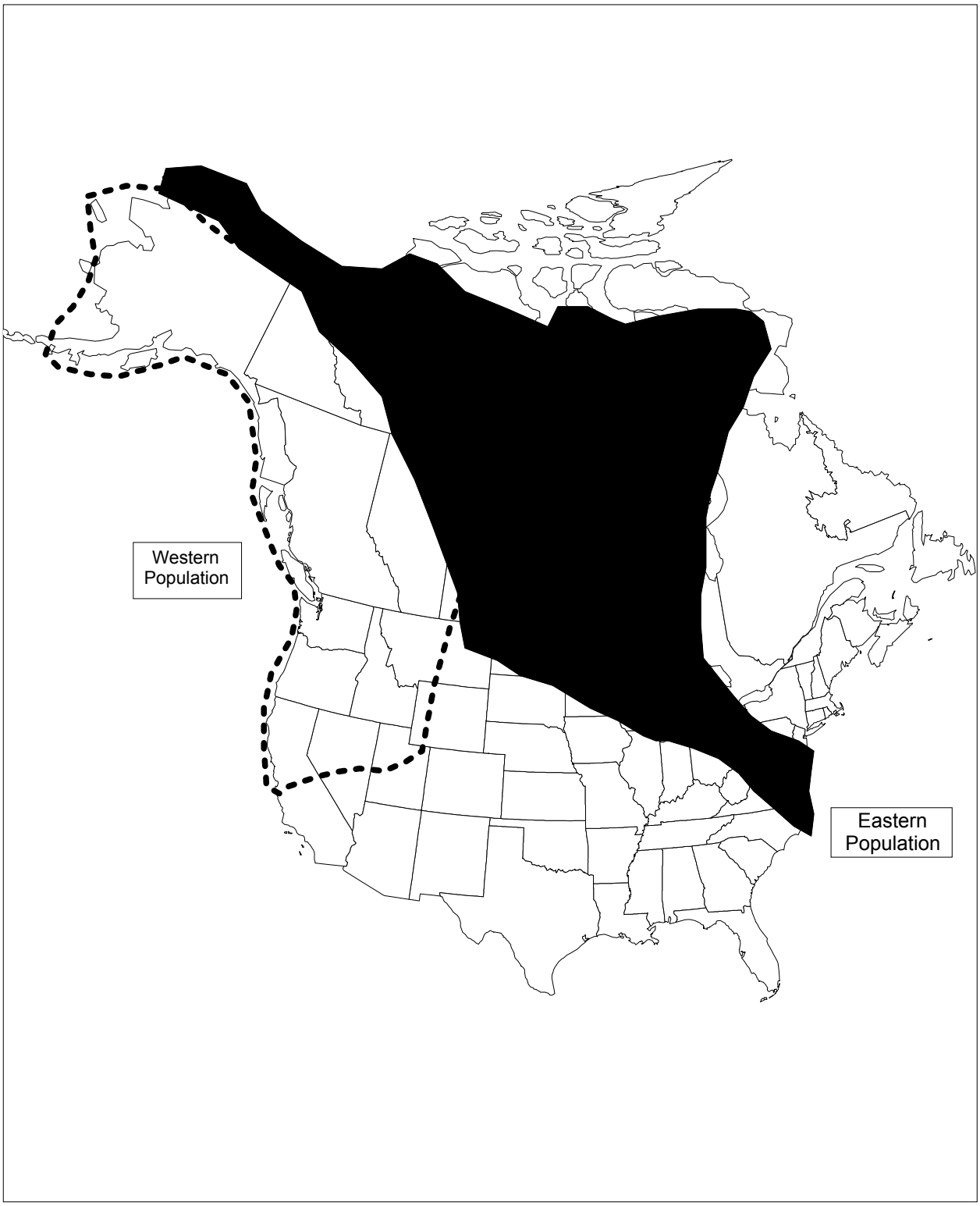


Figure 2. Approximate range of the 2 management populations of Tundra Swans, Western and Eastern, in North America.

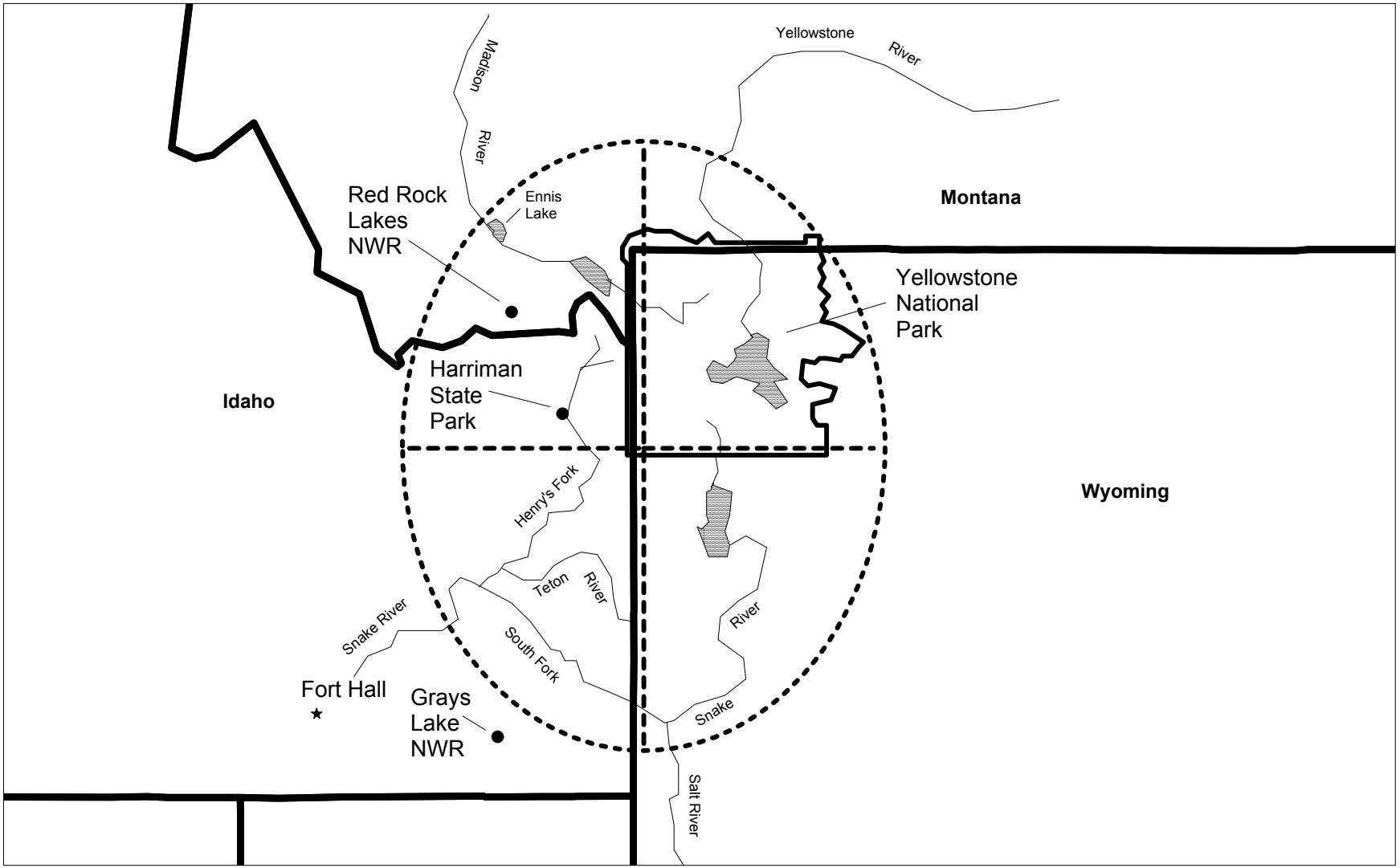
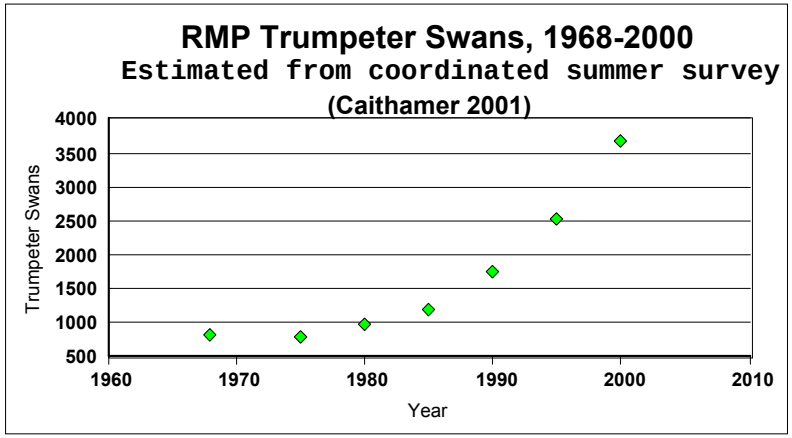
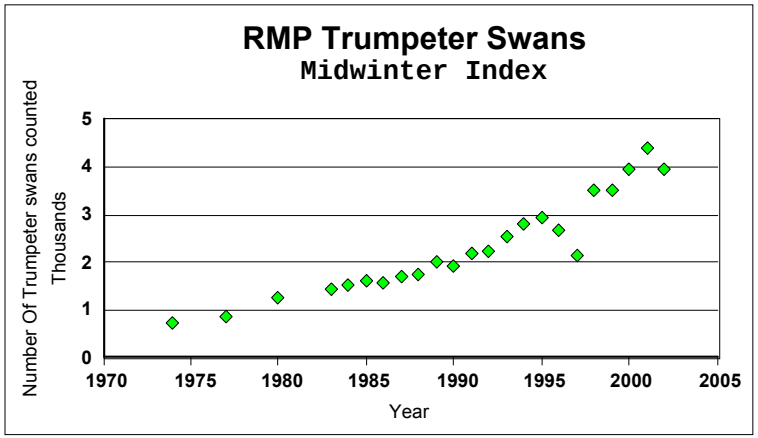
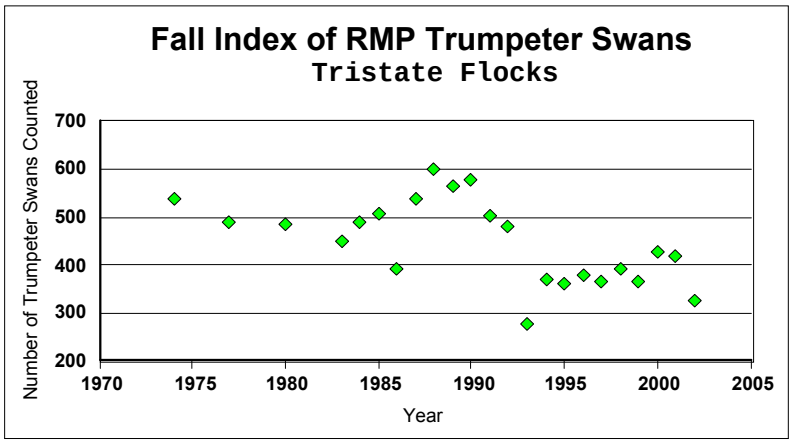


Figure 3. Tristate area of southwestern Montana, eastern Idaho, and northwestern Wyoming, with 4 quadrants delineated to assess winter trumpeter swan distribution (from Shea and Drewien 1999).







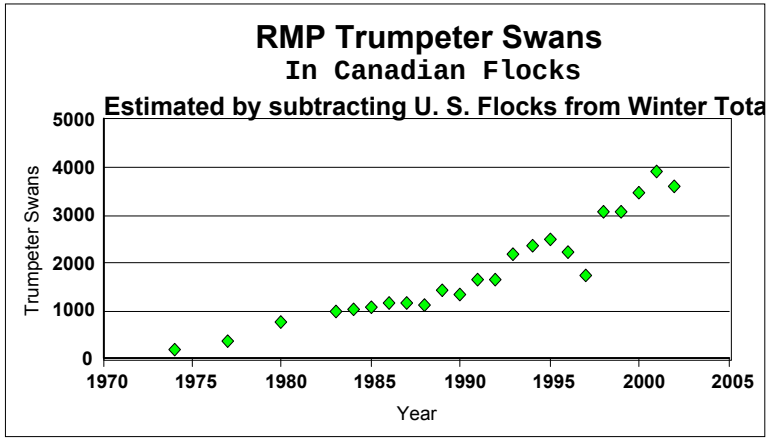


Figure 4. Estimates of RMP Trumpeter Swans from the coordinated summer survey (Caithamer 2001), and the U.S. Fall and Midwinter surveys (Dubovsky 2003a, Dubovsky 2003b).

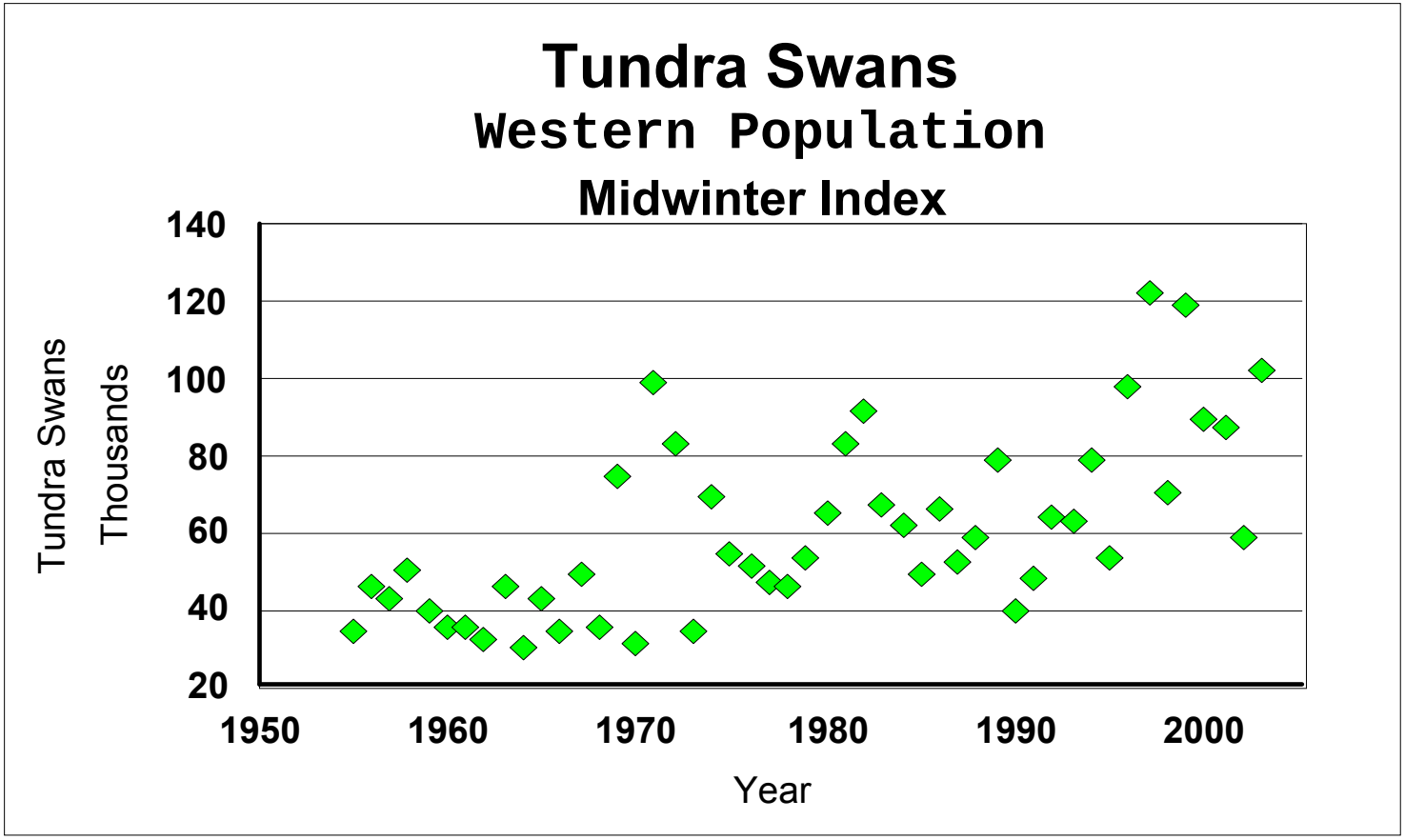


Figure 5. Midwinter index of the Western Population of Tundra Swans, 1955-2003.

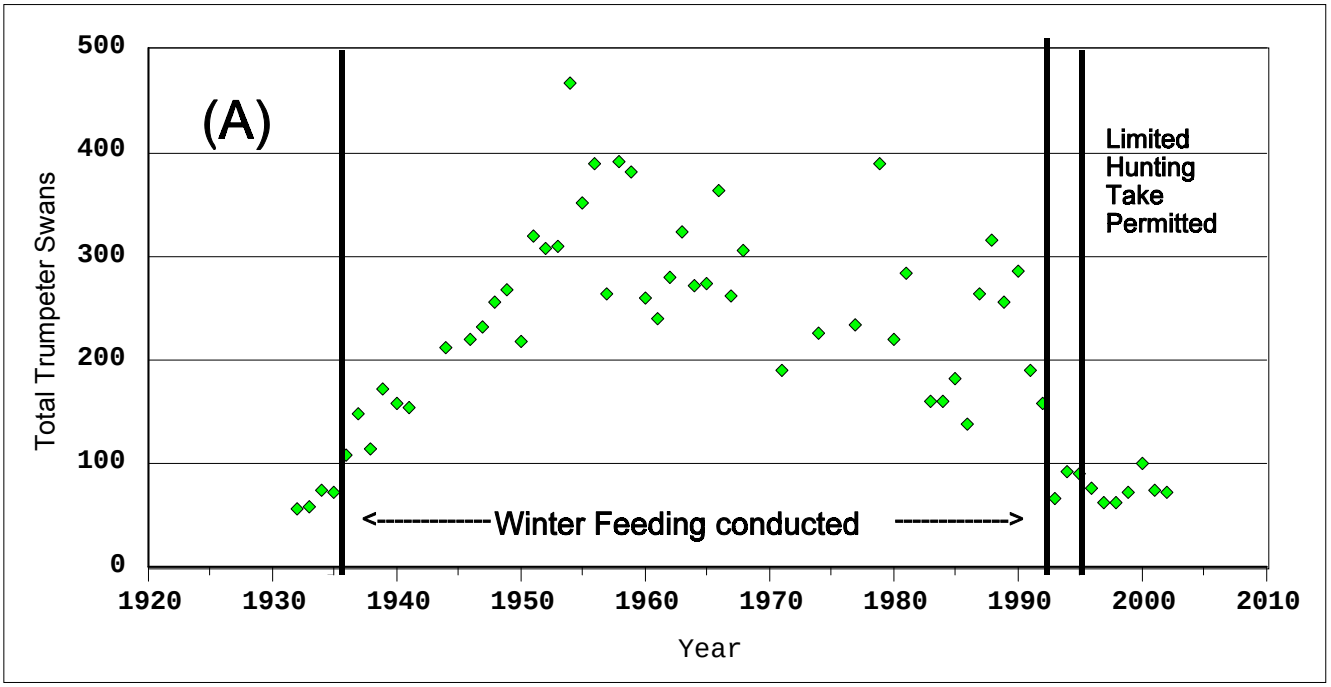


Figure 6. (A) Numbers of Trumpeter Swans counted at Red Rocks Lake, NWR and Yellowstone, NP in the annual Fall index 1932-2002 and (B) Numbers of Trumpeter Swans indexed in the RMP Midwinter inventory.